



HEALTH CARE SPENDING IN MARYLAND:

HOW DOES IT DIFFER FROM OTHER
STATES AND WHY?



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This year, the Maryland Health Care Commission is launching a new biennial *Health Care Expenditures Comparison Report* (HCEC) series. This report series replaces the *State Health Care Expenditures* (SHEA) report, which had been published annually by the Commission for the past 13 years. Although the report has changed, our goal is to provide reliable information about trends in health care expenditures to help inform health policy deliberations among health policy experts, health care professionals, executives, and legislators. The report presents the factors that affect health care spending in Maryland and other states including: demographic and socioeconomic characteristics, supply and market variables and decisions made by government and private policymakers. Like the SHEA, the HCEC is designed to convey information on health care spending in Maryland, but improves upon the SHEA with a focus on comparing spending and utilization in Maryland to spending and utilization in other states, using a data set that is consistent for all states.

This focus on comparisons between Maryland and other states necessitates some tradeoffs, particularly in the timeliness of the data. While the reader will note that many of the comparisons are based on information that is not as timely as one would prefer, many of the relationships discussed in this report have proven to be fairly persistent. In the first year of this report series, we encourage the reader to accept that data are not as current as is optimal and use this first report as a primer on the complex interactions that contribute to geographic variations in health care spending.

This report does point to important steps that should be taken. Reducing inefficient use and promoting spending that improves the quality of care and health outcomes will require changing the incentives facing providers and payers. It has long been recognized that better access to primary care services and access to clinical integrated care leads to improved outcomes and often lower total costs of care. Consumers will need to adopt lifestyle and health behavior changes that contribute to the prevention of chronic disease.

The MHCC expects that the content of the HCEC report will evolve over time as sources of data expand, the timeliness of information increases, and the interests of the Maryland General Assembly change.



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Report Highlights

Purpose

This report examines total per capita personal health care spending in Maryland compared to other states—both levels of spending and changes over time. Data documenting different aspects of the health care environment are drawn from a wide variety of sources, in order to provide a multidimensional context for examining the variation in spending across states. This broad perspective is intended to support better understanding of the types of factors underlying state-level variation in spending patterns and trends.

In order to conduct such an analysis, state-level spending data are required; these data must be compiled using a consistent methodology across all states, payer sources, and types of services. Such data are available—based on the National Health Expenditure Accounts—for the years 1991 to 2004. While the data are not as current as desirable, the patterns and forces influencing spending are likely to provide important insights into current spending patterns.

Key Findings

Maryland's Spending Compared to Other States

- In 2004, per capita personal health care spending in Maryland averaged \$5,590, 6 percent above the national average and 17th highest among the 50 states.
- States in the northeastern part of the United States appear to have the highest per capita spending. Compared to Maryland, spending in the highest-spending state (Massachusetts, \$6,683) was 20 percent higher, while that of the lowest-spending state (Utah, \$3,972) was almost 30 percent less.
- The average annual growth rate for spending in Maryland was 4.2 percent from 1991 to 1998, increasing to 7.2 percent from 1998 to 2004. For the United States overall, the average annual rate

of spending growth was somewhat higher than Maryland in the earlier period (4.8 percent) and somewhat lower in the later period (6.3 percent). More recent data show the average annual growth rate in the United States continuing to decline through 2008.

- Nearly one in five dollars (18.8 percent) of personal health care spending in Maryland for 2004 was attributable to the Medicare program, just slightly below the national average. The share going to Medicaid was 20 percent lower in Maryland than in the nation overall. Since 2004, Maryland has made substantial changes in its Medicaid program, phasing in an expansion that increases Medicaid eligibility for parents and the primary care services offered to adults.
- Across all states, the association between the rate of growth in the earlier period studied (1991-1998) and the level of total per capita spending in 1998 is positive and modest; the association between the rate of growth in that period and spending in 2004 is also positive and somewhat stronger.

The Role of Demand-Side Factors in Spending Variation

- Underlying geographic variation in health care spending are differences in utilization of services and the prices paid for those services. Utilization is driven by a range of complex and interrelated factors; health status is a major determinant and is in turn influenced by health behaviors, age, income, race/ethnicity, and other sociodemographic characteristics. These interrelationships are difficult to disentangle.
- The poverty rate, in particular, is strongly associated with rates of uninsured, health status, and cancer mortality.
- Controlling for all demand variables, cancer mortality rates were the only statistically significant determinant of per capita spending.

- Factors associated with demand explain over half of the variation in state health care spending when only demand-side indicators are considered.

The Role of Supply-Side Factors in Spending Variation

- Several factors, including the per capita number of physicians and dentists as well as the number of skilled-nursing facility (SNF) beds per capita were found to be significantly associated with state-level health care spending.
- After controlling for demand, market and policy, and other supply-side factors, the supply-related factors explaining the greatest variation in state health care spending included: (1) per capita supply of physicians, (2) number of acute care beds per capita, and (3) number of SNF beds per capita.
- Together, supply-side factors account for 63 percent of the variation in state health care spending.
- As with the demand-side variables that were examined, supply-side factors are highly correlated with one another.

The Role of Market Factors and Policy Initiatives

- The market environment is shaped by demand and supply factors as well as by policy and regulatory forces that collectively affect health care spending in a variety of direct and indirect ways. Policy initiatives and actions of other stakeholders can impact the level of resources available to providers or consumers, or the particular mix of services available.
- While Maryland's market environment is marked by high consolidation in both the insurance and hospital services market as defined by traditional economic measures, the markets are not more consolidated than most other states. Both of these factors have only a small association with spending.

- The market characteristic most strongly associated with spending is health insurance premiums, followed by the wages of health care managers and the percentage of employees offered health insurance through their jobs.
- In terms of policy measures, Maryland has a relatively large number of requirements in place, including hospital rate-setting (1 of 2 states), Certificate of Need (CON) requirements (1 of 36 states and a higher than average number of services requiring approval), a relatively high number of mandated insurance benefits, and a standardized plan in the small-group market, with some premium subsidies.
- The policy variable with the strongest association with spending is the generosity of Medicaid eligibility. States that have had Certificate of Need requirements in place throughout the study period appear to have higher average spending; whether the CON process reduces capacity and increases costs or whether policymakers have implemented CON in response to high spending is not clear. States with caps on noneconomic damages related to malpractice claims appear to have lower average spending.

Conclusions

States are unique in their health care infrastructures, characteristics of the population, and their economic and policy environments. Findings from these analyses have shown that a diverse set of factors—health care demand, provider supply, market and policy environments—drive state-level spending on health services. While these factors account for 90 percent of the per capita variation in health care spending, it is important to note that only seven factors were found to be significantly associated with per capita spending when controlling for other influences:

- Proportion of the population in fair or poor health
- Short-term hospital beds per capita
- Physicians per capita
- SNF beds per capita
- Medicaid enrollment generosity

- Hospital per diem costs, and
- Average insurance premiums.

These factors are highly interrelated and it is difficult to isolate the effect of individual elements on state health care spending. Although the factors examined in this report were found to explain a substantial portion of the variation in state health spending, data were not sufficient and the relationships between variables not adequately understood to determine causation.

Relatively high per capita spending is often thought to indicate inefficiency in the health care system. However, it is possible that greater per capita spending reflects higher-quality care. To date, little is known about the extent to which spending on health care services contributes to positive health care outcomes. Until further research is conducted to understand the relationship between health care spending and quality, policymakers should be cautious about assuming that relatively high per capita spending is evidence of local market inefficiencies.

One approach to more efficiently target the use of resources is by identifying and rewarding processes of care and health outcomes that signify higher quality; this approach is being adopted in many states, including Maryland. Emphasizing primary care management and coordination across sites of care may make spending for the growing number of persons with chronic health conditions more effective. While these policies do not directly target the level of resource supply, their intent is to create incentives to use existing resources more efficiently. As these initiatives mature, we would expect to see changes both in the level of supply and the mix of resources, with growth in those producing higher quality care and declines in those that do not. Ultimately, one would hope to observe a shift in the relationship between resource supply and spending in those states that are more successful in promoting quality health outcomes.

CHAPTER 1

Introduction

This report examines total per capita personal health care spending in Maryland compared to other states—both levels of spending and changes over time. This expenditure report replaces the State Health Expenditure Account (SHEA) report that had been published annually by the MHCC. The purpose of this new report—like the old report—is to convey information on health care spending in Maryland. In contrast to the old report, the new report will:

- compare spending in Maryland to that in other states;
- provide richer contextual data to allow better understanding of the factors that influence spending patterns and trends; and
- make use of existing information on spending and utilization that is available from other organizations (such as the Centers for Medicare & Medicaid Services), making the new report less expensive to produce.

The new report also presents an important trade-off in that comparative information on spending is not as timely as the primary source data gathered directly by the MHCC in the SHEA report. In the future, we hope to improve timeliness by working more closely with the primary data collectors to better align our reporting cycles with theirs.

The new report will be produced every 2 years, and the content of the report will change over time to enable the Commission to make use of the most interesting and useful information available in any particular production year. This year's report presents an overview of the variation in health care spending across Maryland and selected states, followed by a comparison of these states in: factors affecting demand for health care, factors affecting supply of health care, and aspects of market and policy characteristics that affect health care spending.

Data documenting different aspects of the health care environment are drawn from a wide variety of sources in order to provide a multidimensional context for examining the variation in spending across states. This broad perspective is intended to support better understanding of the types of factors underlying state-level variation in spending patterns and trends. The objective is to shed light on the following question: To what extent are spending outcomes in Maryland associated with each of the following elements: (i) factors affecting the demand for health care services; (ii) factors affecting the supply of health care services; and (iii) market characteristics and key policy initiatives? In order to conduct such an analysis, state-level spending data are required that are compiled using a consistent methodology across all states, payer sources, and types of services. Such data are available—based on the National Health Expenditure Accounts—for the years 1991 to 2004.¹ While the data are not as current as desirable, the patterns and forces influencing spending are likely to provide important insights into current spending patterns.

This chapter begins with a review of what is known about geographic variation in health spending, with a focus on some of the most noted and recent research exploring the underlying factors that influence observed variation. Key features of Maryland's health care environment are identified and discussed to provide context for the discussion of spending, and an overview of available statistics on state-level spending highlight how Maryland stands relative to other states and the nation overall. **CHAPTER 2** presents data on a variety of demographic and socioeconomic factors that may affect health care use and spending—both across states and over time. **CHAPTER 3** focuses on supply-side forces, and **CHAPTER 4** presents aspects

¹ The state health expenditure accounts, by state of residence, are based on the National Health Expenditure Accounts, the official government estimates of health spending in the United States. More information is available at http://www.cms.hhs.gov/NationalHealthExpendData/05_NationalHealthAccountsStateHealthAccountsResidence.asp#TopOfPage.

Does Higher Spending Lead to Higher-Quality Health Care?

Relatively high per capita spending is often interpreted as indicating inefficient health care systems, but it may be associated with higher-quality care. To date, however, there is relatively little evidence on the relationship between spending and quality and almost all of it focuses on the Medicare population. Quality is usually measured in one of two ways. The first focuses on the processes of care—for example, the percentage of adults who received a blood cholesterol measurement in the past 5 years or the percentage of adult surgery patients who received appropriate timing of antibiotics. The second approach is to measure population health outcomes—for example, deaths per 1,000 adult hospital admissions with congestive heart failure as principal diagnosis or maternal deaths per 100,000 live births.

Evidence from studies of Medicare spending indicate that areas with higher-than-average spending do not score better on either of these types of quality indicators. An additional finding from these studies is that in high-spending areas more patients receive costly treatments than in low-spending areas. These costly treatments appear to improve health outcomes for some patients, but also to worsen health outcomes for other patients. Thus, the relationship between spending and quality may vary by patient population as well as by disease.

However, the relationship between Medicare spending and quality may be different than that between overall spending and quality. Data limitations make it more difficult to do comprehensive analyses of quality for non-Medicare populations. The Agency for Healthcare Research and Quality (AHRQ) has created a state-level quality index based on a large number of data sources. This index appears to be more highly correlated with state-level per capita spending than has been found in the Medicare analyses described above. Until more research is done, policymakers should be cautious about assuming that evidence of relatively high per capita spending is evidence of local market inefficiencies.

of policy and market characteristics that could influence spending. In **CHAPTER 5**, the relationship between health care spending, the demand and supply of health care services, and policy initiatives is examined. A description of the data sources is provided in the Appendix to this report.

The State of the Art in Geographic Variation in Spending

Health care spending—whether measured by type of service, source of payment, or total per capita—varies widely across the United States. There is voluminous literature on this variation in spending, the most prominent being that associated with the Dartmouth Atlas of Health Care. The Dartmouth Atlas documents variations in how medical resources are distributed and used in the United States.² A recent study by researchers affiliated with the Dartmouth Atlas Project found a threefold variation in 2006 Medicare spending across local geographic areas, referred to as hospital referral regions. Even after controlling for differences across these geographic areas in prices and in patient illness, two-thirds of the variation in spending remained. The authors point to differences in the volume of services received by similar patients and conclude that the supply of health care providers and local practice patterns have the strongest influence on spending.³

While these analyses have illuminated our understanding of spending patterns, the lack of uniform national data has limited most of these analyses to the Medicare fee-for-service population. Since Medicare is a government program paid for largely by tax revenues, this variation is of considerable policy interest. At the same time, Medicare beneficiaries represent only 15 percent of the U.S. population and roughly 20 percent of total health care spending; in addition, payments made by Medicare include targeted amounts to particular programs (for example, graduate medical education payments

² Dartmouth Atlas of Health Care, <http://www.dartmouthatlas.org/>.

³ Fisher E, Goodman D, Skinner J, Bronner K. "Health Care Spending, Quality, and Outcomes: More Isn't Always Better," February 27, 2009. http://www.dartmouthatlas.org/atlas/Spending_Brief_022709.pdf.

to teaching hospitals) that may distort per beneficiary spending calculations. Medicare also uses pre-set geographic adjusters so that measured price differences in Medicare are, in essence, artifacts of payment policy constructs and not of local market conditions.

Studies of geographic variation relying on non-Medicare data are few. An analysis conducted by researchers from CMS' Office of the Actuary stands out as an exception and as a model for the analysis presented in this report.⁴ Their study examines health care spending across all 50 states and the District of Columbia; the influences of sociodemographic characteristics and provider supply, as well as the relationship between per enrollee Medicare and Medicaid spending and total per capita spending, are explored. Nearly half of all states show an inverse relationship between Medicare spending per beneficiary and total per capita spending, suggesting that the factors influencing Medicare variation may differ from those affecting total spending. Medicaid spending per enrollee, in contrast, tends to align more closely with total per capita spending by state.

A fairly comprehensive report on geographic variation in health care spending was prepared by the Congressional Budget Office (CBO) in 2008.⁵ While the analysis emphasizes Medicare spending, several findings are noteworthy. An examination of geographic variation in spending by the Veterans Affairs (VA) health care system relative to Medicare found that the gap in variation has diminished markedly in recent years. Thus, geographic variation in the VA system is now comparable to that in Medicare, even though the former is a centrally budgeted system with a strong institutional emphasis on adherence to clinical guidelines. The CBO authors point to local practice patterns as a driving force. The report also compares the extent of variation between Medicare spending per beneficiary and total health spending per capita. They show that variation in Medicare spending has generally declined substantially over the past 30 years, while the variation in total spending has risen slowly.

⁴ Martin AB, Whittle L, Heffler S, Barron MC, Sisko A, and Washington B. "Health Spending By State Of Residence, 1991–2004," *Health Affairs* Web Exclusive 18 September 2007.

⁵ Congressional Budget Office, *Geographic Variation in Health Care Spending*, February 2008.

The Relationship Between the Level of Spending and Growth in Spending

From a cost-containment perspective, it is instructive to examine the relationship between levels of spending and growth rates in spending—if a policy targets higher-spending areas, will it be successful in reducing growth in costs? Studies focused on the Medicare program indicate that there is no relationship between Medicare spending per beneficiary and the rate of growth in that spending in the preceding period.⁶ Although this is true for the Medicare program, there appears to be little association between Medicare spending per beneficiary and total per capita health care spending at the state level. In analyzing total per capita spending data and related growth rates, several conclusions can be drawn. First, not surprisingly, the association between total per capita health spending in 1998 and 2004 is quite strong. Maryland's spending fit this pattern—among the 50 states, Maryland was 21st in 1998 and 17th in 2004. In addition, the association between the average annual rate of growth in the earlier period (1991–1998) and the later period (1998–2004) is fairly strong. Maryland's own growth of 4.2 percent in the first period and 7.2 percent in the second was somewhat different from this overall pattern, with one of the largest differences of all states in growth between the two periods. In contrast to the findings from Medicare analyses, the association between the rate of growth in the earlier period (1991–1998) and the level of total per capita spending in 1998 is positive and modest; the association between the rate of growth in this earlier period and spending in 2004 is also positive and somewhat stronger. One other finding is worthy of note: the association between the level of spending in 1998 and the rate of growth in the subsequent period (1998–2004) is small and negative, suggesting that efforts were made in states with relatively higher spending in the earlier period to reduce the rate of growth in subsequent years. While no state had its growth rate fall between the first and second periods, among those states with the smallest increases in growth were five states with relatively high spending in 1998. These states were Louisiana, West Virginia, Iowa, Connecticut, and New Jersey. In contrast, Maryland's spending was in the middle quintile in 1998, but its growth rate in the subsequent period was relatively high.

⁶ Dartmouth Atlas of Health Care, <http://www.dartmouthatlas.org/>.

While considerable work has been conducted in an effort to identify the factors driving health care spending, there remains a substantial portion of the variation that is unexplained. This ‘unexplained’ portion is often attributed to supply of health care resources or local practice patterns. Based on the extent of variation, the CBO report notes that “(t)he evidence suggests that efficiency gains in the health care system are possible...but policies that reduce spending in high-spending areas would not necessarily lead to increased efficiency unless the reductions target ineffective or harmful treatments.” Thus, the goal should not be to reduce geographic variation per se but to study geographic variation in order to identify sources of inefficiency.

Key Features of Maryland's Health Care Environment

State Regulation

HOSPITAL RATE-SETTING. Maryland's regulation of its health care delivery system and insurance markets differentiates it from other states. In particular, Maryland is the only state still operating an all-payer rate-setting system for hospital services. Since 1977, all payers—including Medicare and Medicaid—pay hospitals for inpatient, outpatient, and emergency services based on rates set by the Maryland Health Services Cost Review Commission (HSCRC).⁷ HSCRC is required to establish rates such that the total costs of all services offered by a hospital are reasonable; a hospital's total revenues are reasonably related to its total costs; and rates are set equitably among all purchasers of hospital services. As part of the rate-setting process, the “expected costs” for each hospital of providing uncompensated care—based on bad debt and charity care loads and applied prospectively—are incorporated into its all-payer rates. Under this system, hospital costs per admission in Maryland have decreased from 23.6 percent above the national average in 1974 to 5.1 percent below the national average in 2005.⁸ However, more

recent data show that the state's rate of increase in hospital costs per admission has become closer to the national average. This has prompted the HSCRC to take steps to slow the rate of growth in costs per admission. These steps include less generous annual adjustments in hospital rates, implementation of a revised payment system using new diagnosis-related groups designed to better track resource use associated with a hospital stay, and payment reforms that encourage hospitals to reduce highly avoidable hospital complications.

INSURANCE MARKET FOR SMALL GROUPS. Maryland law has also created a health insurance product for small employers. All insurance carriers selling in Maryland's small employer market (defined as employers having 2 to 50 eligible employees) are required to offer a comprehensive standard health benefit plan (CSHBP). Services offered under the plan may be expanded and cost-sharing arrangements lowered through riders to the plans. The CSHBP provides guaranteed access to coverage for small businesses and their employees, allows comparison shopping through a standardized offering, and regulates premiums so that on average the premium for the CSHBP portion of all policies sold does not exceed 10 percent of Maryland's average annual wage.⁹ In addition, small businesses with 2 to 9 employees may be eligible to receive premium subsidies through the Health Insurance Partnership (HIP), established in 2007. While Maryland is one of 24 states that currently mandate a standard benefit package in the small-group market, it is one of only 8 states offering health insurance subsidies in the small-group market.¹⁰

Geographic Patterns of Service Use

Maryland's health care system is also strongly influenced by the large share of the state's population that lives close to metropolitan areas in adjacent states. The state of Maryland shares borders with the District of Columbia, Virginia, West Virginia, Pennsylvania,

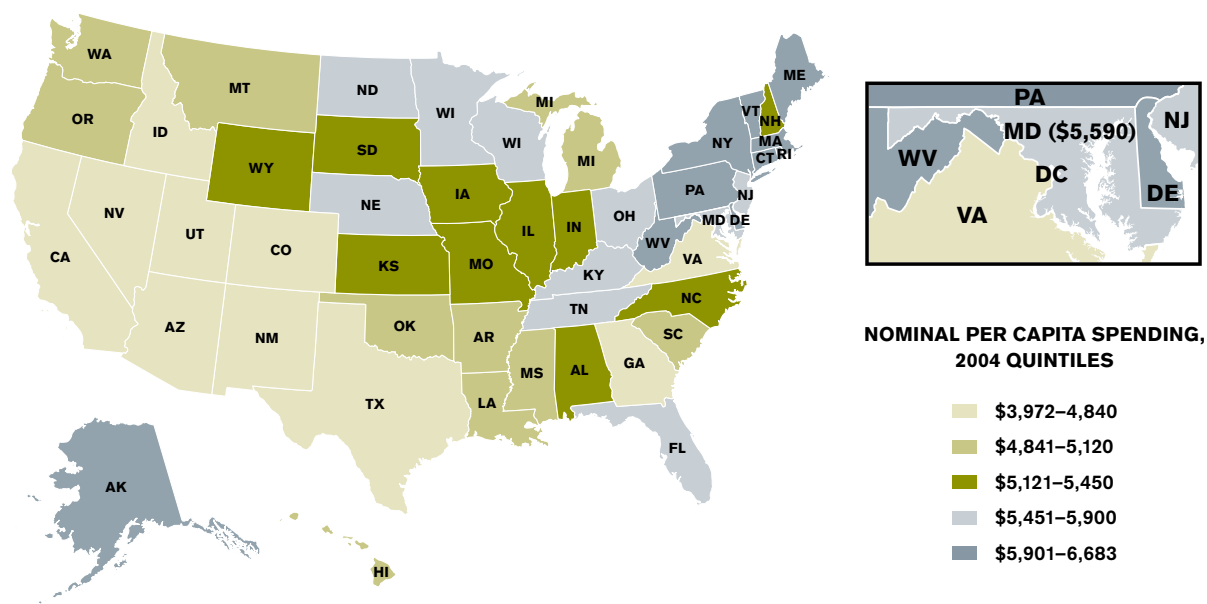
⁷ In 1971, the Health Services Cost Review Commission (HSCRC) was established. HSCRC was authorized to set hospital rates (excluding physician fees) in 1974. See details at <http://www.hscrc.state.md.us/>.

⁸ *Maryland's All-Payer Hospital Payment System* by Harold Cohen, 2005. www.hscrc.state.md.us/.../MarylandHospitalRateSystem2005.pdf.

⁹ The average premium, without riders, stood at 85 percent of the wage cap in 2008. “Maryland's Small Group Market Summary of Carrier Experience for the Year Ending December 31, 2008,” Maryland Health Care Commission, September 2009. <http://mhcc.maryland.gov/smallgroup/carrierexp0909.pdf>.

¹⁰ Kaiser State Health Facts, Protections in Small Group Market, Comparison Report. <http://www.statehealthfacts.org/comparereport.jsp?rep=7&cat=7>.

FIGURE 1-1. Per Capita Personal Health Care Spending by State of Residence, 2004



SOURCE: Centers for Medicare & Medicaid Services, Health Expenditures by State of Residence, 2004

and Delaware. Because people tend to use health care services near where they live or work, persons living or working near a Maryland border with one of these other jurisdictions often use out-of-state health care professionals or facilities. In addition to convenience, patients may seek care outside of the state based on providers with reputations in treating specific conditions or performing highly specialized procedures. This is important for two reasons. First, there is a data measurement issue. While the data used for this report have been adjusted for the flow of payments related to border-crossing, the adjustments are primarily based on Medicare fee-for-service claims data and may result in some inaccuracy.¹¹ Second, this cross-border use demonstrates that geographic boundaries do not strictly define health care delivery markets and highlights the complexity of fully understanding and measuring the supply and policy environment.

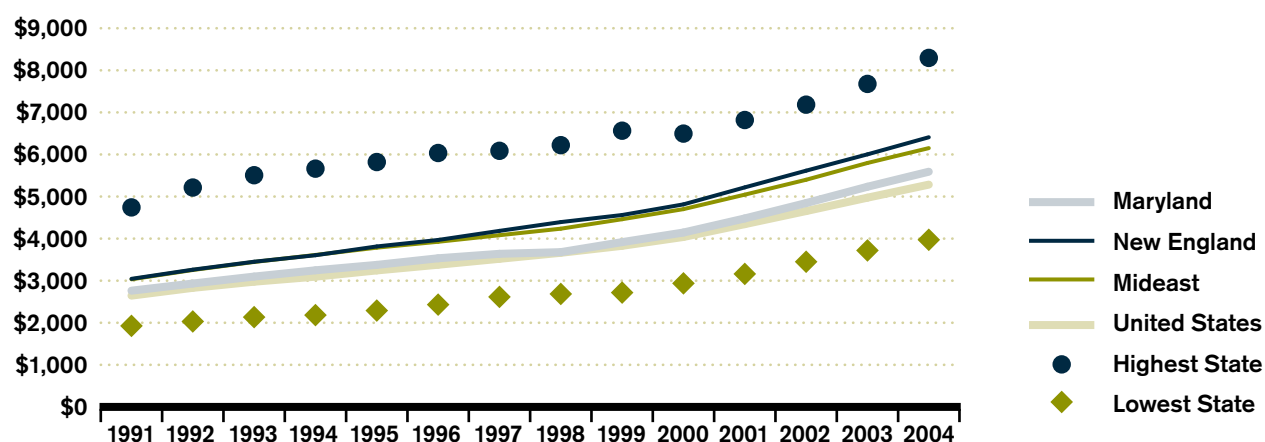
MHCC has conducted several analyses of out-of-state use of health care services by Maryland residents (as well as out-of-state residents who obtain care in Maryland).¹² Examining the percentage of procedures obtained out-of-state by county of patient residence in 1997, there was considerable variation with the highest proportion of border-crossing occurring by residents of Cecil, Garrett, Prince George's, and Montgomery Counties. Residents of Cecil and Garrett Counties are likely receiving care in the areas of Dover, Delaware, and Morgantown, West Virginia, respectively, while those from Prince George's and Montgomery Counties are primarily crossing over into the District of Columbia for care.¹³ Analysis of border-crossing for inpatient care among Maryland Medicare beneficiaries in 1997 found that out-of-state use accounted for more than 10 percent of discharges and nearly 15 percent of inpatient

¹¹ Inpatient hospital and physician services were adjusted using private hospital discharge information and physician claims records to account for services used by the non-Medicare, non-Medicaid population. For more detail, see State Health Expenditure Accounts, by State of Residence: Data Sources & Methods, <http://www.cms.hhs.gov/NationalHealthExpendData/downloads/res-methodology.pdf>.

¹² 1999 Geographic Variations in Practitioner Expenditures and Utilization. http://mhcc.maryland.gov/health_care_expenditures/99geogrpt/.

¹³ A recent analysis of state-border crossing patterns across the United States finds that the largest percentage of border-crossing occurred in D.C., which the authors note provides care to residents of Maryland and Virginia. Martin AB, Whittle L, Heffler S, Barron MC, Sisko A, and Washington B. "Health Spending By State Of Residence, 1991–2004," *Health Affairs Web Exclusive* 18 September 2007, page 659.

FIGURE 1-2. Per Capita Personal Health Care Spending for Maryland, U.S., and Selected Regions, 1991–2004



NOTE: Spending is in nominal dollars (i.e., not adjusted for inflation). The Mideast region includes Delaware, the District of Columbia, Maryland, New Jersey, New York, and Pennsylvania, and New England includes Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.¹⁴

SOURCE: Centers for Medicare & Medicaid Services

payments. Hospitals in the District of Columbia accounted for the majority of the out-of-state use. In turn, Maryland hospitals draw patients from bordering states and beyond; nearly 13 percent of Medicare discharges from Maryland hospitals and 10 percent of Medicare inpatient payments (also in 1997) were for residents of other jurisdictions.

Where Does Maryland Rank in Health Care Spending?

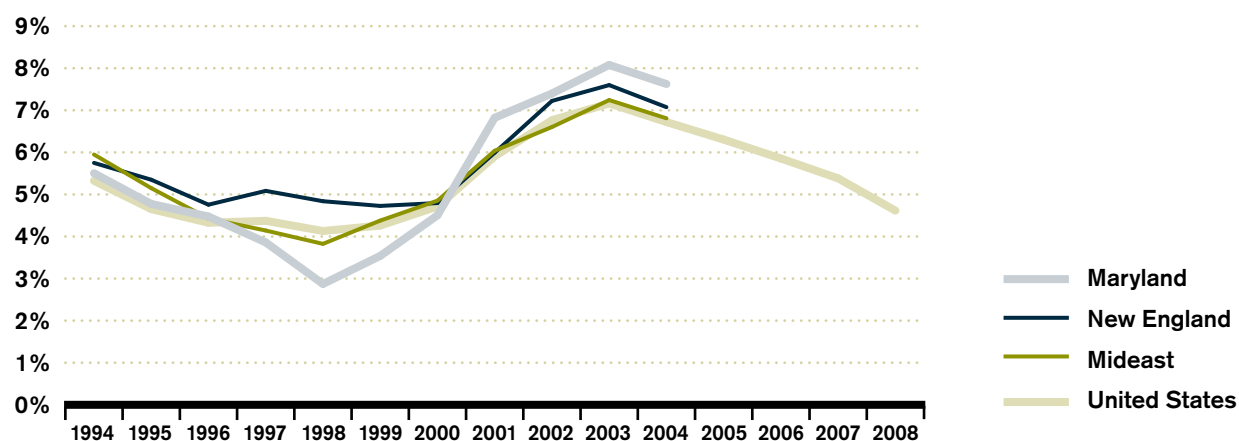
Trends in Per Capita Personal Health Care Spending, 1991–2004

In 2004, per capita health care spending in Maryland averaged \$5,590; this level of spending was 6 percent above the national average and placed the state 17th highest among the 50 states.¹⁵ The range of spending across states is shown in Figure 1-1; states have been ranked from highest to lowest in terms of spending and divided into five groups of 10 states each, or quintiles. Maryland is in the second quintile. Compared to Maryland, spending in the highest-spending state (Massachusetts, \$6,683) was 20 percent higher while that of the lowest-spending state (Utah, \$3,972) was almost 30 percent less. States in the northeastern part of the United States

¹⁴ Regions are defined according to the U.S. Bureau of Economic Analysis. http://www.bea.gov/newsreleases/regional/gdp_state/gsp_newsrelease.htm.

¹⁵ D.C. is included in national estimates presented in this report but not in state-level analyses. Its small share of the metropolitan area's population, large share of its providers and the high level of integration of health care markets across the metropolitan area make D.C.-specific estimates of health spending, wages, provider supply, and other key measures relatively unreliable. Measures for D.C. are particularly vulnerable to methodological decisions made when data are collected and used to develop data estimates, as in the case of border-crossing for health services use discussed above.

FIGURE 1-3. Growth in Per Capita Personal Health Care Spending for Maryland, U.S., and Selected Regions, 1991–2004, additional years for U.S.



NOTE: Growth rates are calculated as a 3-year moving average of the annual percentage change in spending. Moving averages are used to reduce the effect of short-term fluctuations so as to more easily observe underlying data trends.

SOURCE: Tabulations of data from the Centers for Medicare & Medicaid Services

appear to have the highest per capita spending, followed by states in the Mideast and Great Lakes regions. States with the lowest spending are located primarily in the Southwest and Rocky Mountain areas of the country.

Per capita personal health care spending in Maryland (in nominal dollars, not adjusted for inflation) is shown in Figure 1-2 for the period from 1991 to 2004. From 1991 through 1997, Maryland's spending was approximately 3 to 5 percent above the overall U.S. average. In 1998, average per capita spending was the same in Maryland as in the nation overall, followed by several years of a small but widening gap, with health care spending in Maryland almost 6 percent above the national average in 2004. Regional spending for the Mideast region and for New England was somewhat higher than that for Maryland, with the gap increasing slightly in the late 1990s, particularly for New England. Also shown is the spending level for the state that has the highest and lowest spending in each of the study years; note that this state may differ from year to year.

Maryland's ranking in terms of total per capita spending has changed fairly substantially over the period from 1991 to 2004, with Maryland moving from among the top 10 states in the nation or highest spending quintile in 1991, down to the middle or third quintile in 1998, and then back up slightly

to the second-highest-spending quintile in 2004. Six states—Connecticut, Delaware, Massachusetts, New York, Pennsylvania, and Rhode Island—remained in the top spending quintile in each of those 3 years, and 3 states—Idaho, New Mexico, and Utah—were in the lowest-spending quintile in all 3 years.

Rate of Growth in Per Capita Personal Health Care Spending, 1991–2004

Figure 1-3 shows the rate of growth in per capita health care spending over time for Maryland, the Mideast region, New England, and the United States overall. A similar pattern is observed across these jurisdictions, with the rate of growth falling in the latter half of the 1990s, rising through about 2003 and beginning to fall after this time period. The average annual growth rate for Maryland was 4.2 percent from 1991 to 1998, increasing to 7.2 percent from 1998 to 2004. For the United States overall, the average annual rate of growth was somewhat higher than Maryland in the earlier period (4.8 percent) and somewhat lower in the later period (6.3 percent). Because more recent data are available, Figure 1-3 shows the trend in spending through 2008 for the United States overall, with the average annual rate of growth continuing to decline.

TABLE 1-1. Per Capita Personal Health Care Spending and Other Statistics, Maryland, U.S., and Selected States, 1991–2004

	MARYLAND	MARYLAND RANKING AMONG THE 50 STATES	NATIONAL AVERAGE	COLORADO	DELAWARE	MASSACHUSETTS	MINNESOTA	NEW JERSEY	NORTH CAROLINA	OREGON	PENNSYLVANIA	VIRGINIA	WISCONSIN
PER CAPITA SPENDING, 2004	\$5,590	17	\$5,283	\$4,717	\$6,306	\$6,683	\$5,795	\$5,807	\$5,191	\$4,880	\$5,933	\$4,822	\$5,670
AVERAGE ANNUAL GROWTH													
1991–1998	4.2%	44	4.8%	4.0%	5.6%	5.2%	5.8%	5.0%	6.2%	5.5%	4.5%	4.6%	5.0%
1998–2004	7.2	13	6.3	6.4	7.3	6.2	7.2	5.8	7.2	6.6	6.7	6.8	7.6
SOURCE OF PAYMENT, 2004													
Medicare share	18.8	23	19.6	15.4	18.2	18.4	15.0	20.7	19.1	18.3	21.7	17.1	16.2
Medicaid share	14.0	35	17.4	11.4	14.2	19.3	17.7	14.6	18.3	13.9	17.5	10.5	13.7
TYPE OF SERVICE, 2004													
Hospital share	37.2	24	36.6	35	36.7	39.2	33.9	33.8	36.8	34.2	36.4	37.1	37.3
Physician share	25.4	19	25.4	29	23.5	21.2	26.3	24.3	23.1	29.4	23.1	25.6	27.1
Drug share	14.8	21	14.3	11	14.7	12.7	12.3	16.5	16.8	11.7	15.1	15.7	12.3

SOURCE: Centers for Medicare & Medicaid Services, National Health Expenditure Data. http://www.cms.hhs.gov/NationalHealthExpendData/05_NationalHealthAccountsStateHealthAccountsResidence.asp#TopOfPage

Spending Comparisons: Maryland and Selected States

Additional spending comparisons between Maryland and selected states are shown in Table 1-1. These states were chosen to provide a varied perspective in terms of geographic proximity and key demographic attributes relevant to an examination of health care spending. Each of the selected states is similar to or different from Maryland in a way that highlights a particular dimension. Five of the states—Delaware, New Jersey, North Carolina, Pennsylvania, and Virginia—are geographically proximate; Oregon and Colorado provide some representation for the western part of the United States, and Minnesota and Wisconsin for the Midwest. Six of the states—Colorado, Delaware, Massachusetts, Minnesota, New Jersey, and Virginia—are states with relatively high incomes, which may affect different aspects of both personal and government spending. Massachusetts, Minnesota, and Wisconsin each have an uninsured rate no higher than that of Maryland. Like Maryland, Delaware, North Carolina, and Virginia have large African American populations, which may contribute to differences in health status and therefore spending. Three of the states—Wisconsin, Minnesota, and Massachusetts—were selected as states with health care systems producing particularly high-quality outcomes for their residents.¹⁶

Six of the 10 comparison states had per capita spending higher than that of Maryland in 2004. Three of these—Massachusetts, Pennsylvania, and Delaware—were among the top 10 highest-spending states in the nation for that year, and spending in Massachusetts, the highest-spending state, was approximately 20 percent higher than in Maryland. These relative rankings were similar to 1991, and 1998, with two exceptions—Minnesota had lower spending than Maryland in 1991, while Wisconsin had lower spending than Maryland in both 1991 and 1998.

As noted above, Maryland's average annual rate of growth in spending was below the national average in the period from 1991 to 1998 and above the U.S. average during the years from 1998 to 2004. Growth rates in all of the comparison states except for Colorado were greater than that in Maryland in the earlier period; in addition to Colorado, only the

rates of growth in Pennsylvania and Virginia were less than the national average for that period. In the more recent period, 1998 to 2004, Delaware and Wisconsin had faster growth in health care spending than Maryland, while growth in spending in Minnesota and North Carolina was the same as in Maryland. Among the comparison states, the rate of growth during the later period was lowest for New Jersey, where the rate of spending growth was 19 percent lower than in Maryland. Among all 50 states, Maryland's annual average growth rate was 44th in the earlier period, putting it in the lowest quintile, but it rose to 13th highest in the later years.

In 2004, nearly one in five dollars (18.8 percent) of personal health care spending in Maryland was attributable to the Medicare program. Of the comparison states, this proportion was lowest in Minnesota (15.0 percent) and Colorado (15.4 percent) and highest in Pennsylvania (21.7 percent) followed closely by New Jersey (20.7 percent). Among all states in the United States, Maryland ranked 23rd in the share of spending accounted for by Medicare, putting it in the third or middle quintile, and very close to the median state.

The Medicaid share of personal health care spending in Maryland was relatively lower, accounting for one in seven dollars (14 percent). Among the comparison states, the Medicaid share of spending was lower than Maryland in four of the states; it was lowest in Virginia (10.5 percent) and in Colorado (11.4 percent). The highest among the comparison states was Massachusetts, with the Medicaid share in that state accounting for almost one in five dollars of spending. Among all states in the nation, Maryland ranked 35th in terms of the proportion of total spending going toward Medicaid. Since 2004, Maryland has made substantial changes in its Medicaid program, phasing in an expansion that increases Medicaid eligibility for parents and the primary care services offered to adults. The share of total spending attributable to Medicaid may therefore have risen in Maryland in recent years.

States also vary with respect to the distribution of spending by type of health care service. The share of total spending attributable to hospital services, physician care, and drugs is shown in Table 1-1. Nationally, Maryland ranked 24th in hospital spending as a proportion of total spending. In Maryland, 37.2 percent of 2004 spending went to

¹⁶ Quality rankings are from the National Health Quality Report produced by the Agency for Healthcare Research and Quality. <http://statesnapshots.ahrq.gov/snaps08/index.jsp>.

cover the costs of hospital services. This was very close to the national average. Of the comparison states, Massachusetts devoted the highest share of spending to hospital services and New Jersey and Minnesota the lowest shares. Five of the states—Delaware, North Carolina, Pennsylvania, Wisconsin, and Virginia—were similar to Maryland in terms of the hospital share of spending.

One-quarter of spending in Maryland went toward physician care in 2004. This was the same as the national average and placed Maryland 19th among all the states for that year. In both Colorado and Oregon, close to 30 percent of per capita spending went to cover physician services. In Massachusetts, the physician share was only 21.2 percent.

Across the United States, drugs accounted for 14.3 percent of spending, on average, with Maryland only slightly higher at 14.8 percent of spending. Both Delaware and Pennsylvania spent a similar proportion on drugs (14.7 percent and 15.1 percent, respectively). In Colorado, only 11.0 percent of spending was on drugs and in New Jersey and North Carolina the drug share was more than 16 percent. Maryland ranked 21st among all 50 states in the share of spending allocated toward drugs.

CHAPTER 2

Demand for Health Care Services: Population Characteristics and Health Care Spending

Demographic, socioeconomic, and health characteristics of a population have long been associated with utilization of health services and, subsequently, health care spending patterns. This chapter examines population characteristics for the state of Maryland, selected comparison states, and the United States as a whole. Trends are examined for the period between 1990 and 2005. Examining variation across the states as well as tracking changes over time may add insight into the demand-side factors associated with patterns of growth in health care spending.

The chapter begins with a brief review of the literature on the key population characteristics that have been associated with health care utilization. Data are presented documenting how Maryland fares relative to other states in terms of the key descriptors. Finally, associations between these demand-side factors and per capita spending at the state level are explored.

What Factors Influence the Demand for Health Care Services?

Underlying the geographic variation in health care spending described in Chapter 1 are differences across the country in the use of health care services and the prices paid for those services. Utilization is driven by a range of complex and interrelated factors; health status is a major determinant and is in turn influenced by health behaviors, age, income, race/ethnicity, and insurance status. The demographic and socioeconomic characteristics of the population may influence health care spending through their reflection of preferences about the amount or type of services sought or through their association with health care needs. These interrelationships are conceptually complex and difficult to disentangle empirically. In this section, a brief review

is presented of what is known about the relationship between population characteristics and spending for health care services.

Influences of Population Characteristics

AGE. Advancing age is one of the more highly recognized factors affecting demand for health care services. A recent study estimating total personal health care spending among different age groups found that, while per capita spending among adults aged 19 to 64 averaged \$4,511, spending among those aged 65 and over was more than three times higher, averaging \$14,797. Among the most elderly group—those aged 85 and older—per capita spending averaged \$25,691.¹⁷

INCOME AND INSURANCE COVERAGE. Income is also generally associated with higher spending. With most goods and services, people with higher incomes have higher spending and, with respect to health care, there is generally a positive relationship with those in higher income groups using more health care services. This is compounded because those with higher incomes are more likely to have employer-provided health insurance, which is associated with higher use of services and spending. In 2006, about 39 percent of uninsured Americans went without a health care visit compared to only 14 percent of the insured population who went without a health care visit.¹⁸

Many variables influence the likelihood that a person will be insured. Overall, most people in the United States access health insurance through an employer

¹⁷ Hartman, Micah, et al. "U.S. Health Spending By Age, Selected Years Through 2004." *Health Affairs* 27.1 (2008): w1–w12.

¹⁸ National Center for Health Statistics. Health, United States, 2008 With Chartbook Hyattsville, MD: 2009. <http://www.cdc.gov/nchs/hus.htm>.

group; in 2007 more than 62 percent of the United States population under the age of 65 obtained health insurance through an employer.¹⁹ However, the likelihood of having employer-provided coverage and the generosity of the coverage may vary by region, industry of employment, size of employer, and other factors. While poverty or low income reduces the use of health services, due to the availability of public health insurance programs for selected populations, utilization and health care spending may actually be higher among selected low-income groups than among those with moderate incomes.

RACE/ETHNICITY. Variation in health care use and spending associated with race/ethnicity may also be driven by a multitude of underlying factors, including differences in health status, rates of uninsurance, poverty rates, and even differences in treatment responses among racial/ethnic populations. While racial/ethnic minorities tend to spend less on health care due to lack of insurance and lower income levels, health status and delayed access to care can contribute to higher spending. Data from the National Health Care Disparities Report indicate that hospital admissions for amputations among diabetics was over two times higher among African Americans than among whites, driving up the diabetes treatment costs for African Americans relative to whites.²⁰

METRO VS. NON-METRO. Some of the variation across states in health care spending may be related to the proportion of the state population that resides in rural areas. Health care spending may be different in rural areas because of underlying differences in population characteristics as well as differences in health care delivery.²¹ In general, persons living in rural areas are older, have lower incomes, are less likely to have health insurance coverage, and have more health problems. At the same time, there tend to be fewer health care providers and limited access to more specialized services and equipment.

The Importance of Health Status

Despite many connections between demographics and spending, evidence from empirical studies suggests that demographics do not explain much of the variation in health care spending, particularly without directly accounting for underlying health status. There is, however, an established link between poor health status—particularly the presence of chronic conditions—and higher health care spending.²² A CBO analysis of high-cost Medicare beneficiaries found that more than three-quarters of individuals identified as high-cost had at least one major chronic health condition and all of the chronic conditions studied were less prevalent among low-cost beneficiaries. This relationship between chronic health conditions and spending is not restricted to the elderly population—a study using national data that included the less-than-65 population as well as those 65 and over found that persons with three or more chronic conditions had out-of-pocket expenses that were almost three times as high as persons with only one chronic condition.

Because many of these chronic conditions vary in terms of geographic prevalence, they may contribute to observed geographic variation in health care spending. There are a number of underlying factors that are associated with these patterns of illness and thus also influence the geographic variation that is seen in spending. For example, heart disease and diabetes are more prevalent in the southeastern United States than in other parts of the country. These conditions are also more common among African Americans, particularly low-income African Americans, and low-income African Americans reside disproportionately in the Southeast. These kinds of patterns add to the difficulty of disentangling the role of different attributes in spending variation.

¹⁹ National Center for Health Statistics. Health, United States, 2008 With Chartbook, Hyattsville, MD: 2009. <http://www.cdc.gov/nchs/hus.htm>.

²⁰ National Health Care Disparities Report, 2008. U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality. March 2009.

²¹ National Rural Health Association. "What's Different about Rural Health Care?" <http://www.ruralhealthweb.org/go/left/about-rural-health/what-s-different-about-rural-health-care>.

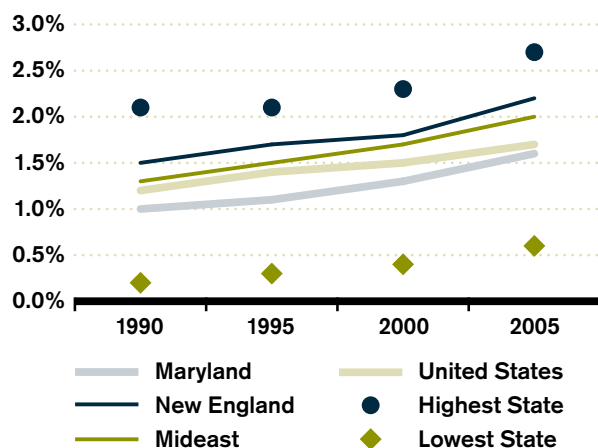
²² See, for example, Congressional Budget Office, "High Cost Medicare Beneficiaries, 2005"; Paez, K, Zhao, L. and Wenke, H. "Rising Out-of-Pocket Spending for Chronic Conditions, a Ten-Year Trend," *Health Affairs*, 28, no. 1 (2009): 15–25 ; Thorpe, K. "The Future Costs of Obesity: National and State Estimates of the Impact of Obesity on Direct Health Care Expenses," Collaborative report, Nov. 2009.

How Does Maryland Compare to Other States on Demand-Side Indicators?

Demographic and Socioeconomic Characteristics

In general, age is strongly associated with health care spending, with spending for children lower than that for other age groups and spending for elderly adults substantially higher. The age distribution in Maryland is similar to that across the country—the percentage of the population less than age 20 was virtually the same in 2004 (27.9 percent vs. 27.8 percent), while the proportion aged 65 and over was just slightly lower (11.5 percent vs. 12.4 percent) (see Table 2-1). Overall, the growth of the population in terms of age is highest in the “oldest old”—persons 85 years of age and over. Spending is also disproportionately high for this group. As shown in Figure 2-1, Maryland’s 85-plus cohort represents a somewhat smaller share of the population than the average across the United States throughout the period from 1990 to 2005. By 2005, the gap between Maryland and the U.S. average in the percentage of the population 85 and older had narrowed to just under 6 percent. Persons 85 and older have a greater presence in the Mideast region overall than in Maryland, and New England has an even higher proportion. In 2005, the state with the highest percentage of persons 85 and over

FIGURE 2-1. Percentage of Population 85 Years of Age and Older for Maryland, U.S., and Selected Regions, 1990 to 2005



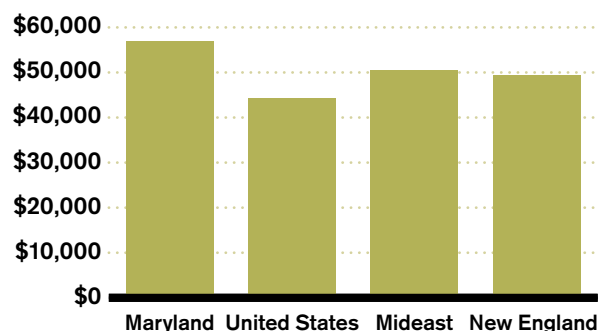
SOURCE: CDC, Wonder Population Statistics

was North Dakota at 2.7 percent; the state with the lowest percentage of the oldest old in that year was Alaska at 0.6 percent.

The composition of Maryland’s population stands out relative to other states most prominently with respect to income characteristics and the race/ethnicity of its residents. The median household income in Maryland was about \$57,000 in 2004, meaning that half of Maryland households earned less than this amount and half earned more (see Figure 2-2). This level of income placed Maryland second in the nation and approximately 40 percent above the national average. By another measure of income, Maryland—with only 9.2 percent of households with annual incomes below the federal poverty level in 2004—ranked 44th in the nation. Maryland’s median income was higher than the average for states in either the Mideast or New England regions. From the perspective of health care spending, relatively high income (or low poverty) may contribute to increased purchasing power for health care services; at the same time, it may contribute to economic well-being and good health, lowering the need for health care service use.

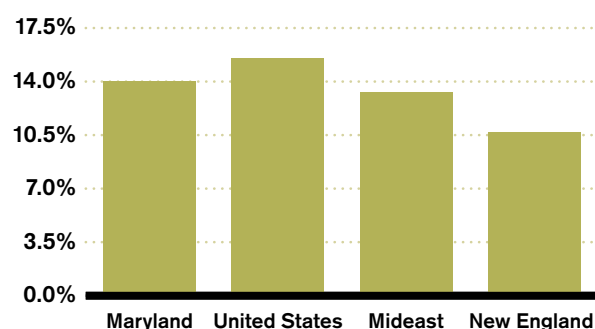
Because health insurance coverage lowers the effective price of using services by paying for a portion of charges, persons without either private or public health insurance generally have lower spending than those with coverage. On an aggregate level, holding all else equal, one might expect to observe that states with a higher proportion of uninsured would have lower per capita spending. For the period 2002–2004, approximately 14 percent of Maryland residents were uninsured, compared to 15.5 percent

FIGURE 2-2. Median Household Income for Maryland, U.S., and Selected Regions, 2004



SOURCE: U.S. Census Bureau, Small Area Income and Poverty Estimates, 2004

FIGURE 2-3. Percentage of Population Lacking Health Insurance Coverage, Maryland, U.S., and Selected Regions, 2002–2004

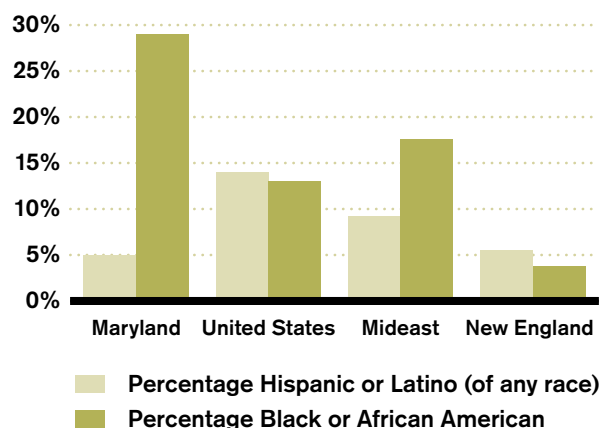


SOURCE: U.S. Census Bureau, Current Population Survey²³

nationally (see Figure 2-3). In this regard, Maryland was roughly comparable to the Mideast region but had a higher uninsured rate than the New England states, on average.

The proportion of Maryland's population that is African American is also high relative to the nation overall (see Figure 2-4). In 2004, almost 30 percent of Maryland residents were African American, more than twice that in the United States as a whole. In general, African Americans have higher prevalence of a number of chronic health conditions, potentially contributing to higher spending. However, African Americans are also more likely to have lower incomes and to be uninsured or covered by Medicaid, characteristics generally associated with lower spending on health care services. The proportion of persons of Hispanic origin in Maryland was lower than nationally—just 1 in 20 of Maryland residents were Hispanic, compared to about 1 in 7 in the United States on average. Hispanics tend to have extremely low rates of insurance coverage and to have relatively

FIGURE 2-4. Percentage of Population by Race/Ethnicity for Maryland, U.S., and Selected Regions, 2004



SOURCE: CDC, Wonder Population Statistics

low rates of use and spending compared to other racial/ethnic groups. In terms of its geographic neighbors, Maryland also had a disproportionately large African American population but is comparable to New England in terms of the proportion of Hispanics. The percentage of foreign-born Maryland residents was slightly below the national average (11.5 percent vs. 13.4 percent). Relevant characteristics of immigrants vary from one subgroup to another—higher rates of infectious disease may contribute to health care costs, while lower incomes and lack of insurance are associated with lower spending.

Maryland has a relatively small non-metro population compared to other states—only 5.2 percent of Maryland's population were rural residents in 2004 compared to a national average of 16.9 percent.²⁴

Health Status Measures

There are a very large number of health indicators, measuring different aspects of population health. In this section, two health outcomes are reported. Health outcomes are traditionally measured by mortality—here, the cancer mortality rate is used to provide one perspective on mortality outcomes. In addition, the proportion of the population reporting that they are in fair or poor health status is used as

²³ These estimates are based on the March 2005 Current Population Survey. Compared with other national surveys, the CPS estimate of the number of people with health insurance more closely approximates the number of people who are uninsured at a specific point in time during the year than the number of people uninsured for the entire year. Income, Poverty, and Health Insurance Coverage in the United States: 2004. DeNavas-Walt C, Proctor BD, Lee CH. Current population reports, series P-60 nos 202; 215; 226; 229. Washington, D.C.: U.S. Government Printing Office, 2005. www.census.gov/hhes/www/hlthins/reports.html.

²⁴ Tabulation by Social & Scientific Systems, Inc., from the 2008 Area Resource File.

TABLE 2-1. Demand-Side Indicators for Maryland Compared to the National Average and Selected States, 2004

	MARYLAND	MARYLAND RANKING AMONG THE 50 STATES	NATIONAL AVERAGE	COLORADO	DELAWARE	MASSACHUSETTS	MINNESOTA	NEW JERSEY	NORTH CAROLINA	OREGON	PENNSYLVANIA	VIRGINIA	WISCONSIN
PER CAPITA SPENDING, 2004	\$5,590	17	\$5,283	\$4,717	\$6,306	\$6,683	\$5,795	\$5,807	\$5,191	\$4,880	\$5,933	\$4,822	\$5,670
DEMOGRAPHIC CHARACTERISTICS													
Percentage less than 20 years of age	27.9%	19	27.8%	28.3%	26.0%	25.4%	27.3%	27.4%	27.4%	26.4%	25.6%	27.0%	26.8%
Percentage 65 years and over	11.5%	41	12.4%	9.8%	13.2%	13.3%	12.1%	13.0%	12.1%	12.9%	15.3%	11.4%	13.0%
Percentage African American,	28.9%	5	13%	4.1%	20.1%	6.0%	4.4%	13.5%	21.7%	2.0%	10.4%	19.9%	6.1%
Percentage Hispanic	5.4%	27	14.1%	18.9%	5.8%	7.7%	3.6%	14.9%	6.0%	9.5%	3.9%	5.8%	4.4%
Percentage foreign born (2003)	11.5%	13	13.4%	10.3%	6.0%	15.4%	6.1%	23.3%	6.3%	8.9%	4.7%	9.8%	4.1%
Percentage rural	5.2%	46	16.9%	14.1%	20.7%	0.4%	27.6%	—	31.0%	23.0%	16.0%	14.6%	27.7%
SOCIOECONOMIC CHARACTERISTICS													
Median income	\$57,019	3	\$41,990	\$50,105	\$49,545	\$53,657	\$51,202	\$57,338	\$40,863	\$42,568	\$43,714	\$51,103	\$46,142
Percentage below poverty	9.2%	47	12.7%	10.2%	9.6%	9.9%	8.1%	8.4%	13.8%	12.9%	11.2%	9.5%	10.9%
Percentage uninsured	14.0%	24	15.5%	16.8%	11.8%	10.8%	8.5%	14.4%	16.6%	16.1%	11.5%	13.6%	10.4%
HEALTH INDICATORS													
Percentage reporting fair/poor health status	12.2%	42	14.7%	12.0%	14.2%	12.4%	11.2%	15.2%	18.9%	16.2%	15.0%	12.9%	12.0%
Cancer deaths per 100,000 population	190.2	23	185.8	159.2	207.3	188.9	176.5	186.1	193.7	188.8	195.3	187.8	185.5

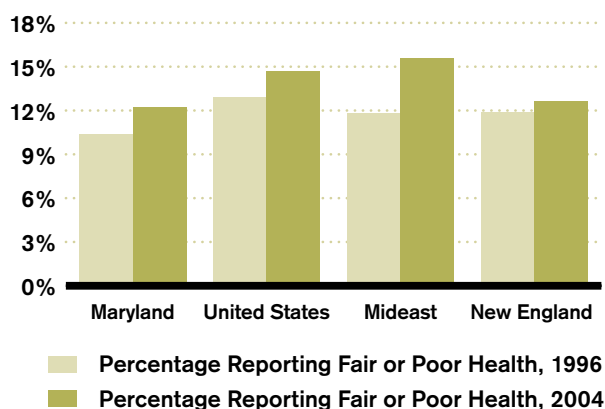
SOURCE: See Appendix.

an overall health status measure. This self-reported measure has been shown to be associated with individual health care spending.

In terms of self-reported health status, Maryland fares relatively well compared to the nation overall. In 2004, just over 12 percent of Maryland's residents reported being in fair or poor health status, compared to almost 15 percent for the U.S. population overall. The proportion of residents in fair or poor health status in Maryland was comparable, on average, to the New England states; residents of the states comprising the Mideast tended to have somewhat worse health, with about 15 percent reporting fair/poor health. In Maryland, as well as nationwide, the proportion of the population saying they were in fair or poor health increased between 1996 and 2004; the increase was 17 percent in Maryland and 14 percent for the United States as a whole (see Figure 2-5).

Age-adjusted cancer deaths per 100,000 population are shown in Figure 2-6, for the period from 1991 to 2004. The cancer mortality rate in Maryland was higher than the rate for the nation as a whole throughout this period. It was also higher than that in the New England region, on average, until 2004, and above the average rate in the Mideast region for the first part of the period. Although the rates for Maryland and the United States have fallen over this period, the rate in Maryland has fallen more steeply. While Maryland's rate was 9.2 percent higher than that of the United States overall in 1991, it was only 2.4 percent higher in 2004.

FIGURE 2-5. Percentage of Population Reporting Fair or Poor Health Status, Maryland, U.S., and Selected Regions, 1996 and 2004

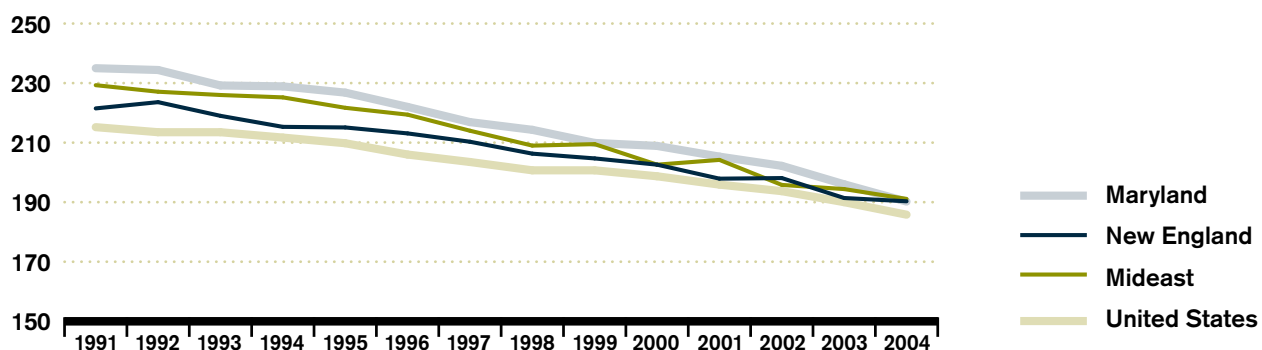


SOURCE: United Health Foundation, America's Health Rankings, by State 1996,2004

Demand-Side Factors: Comparisons Between Maryland and Selected States

In order to highlight some of the variation in health care spending and how it may relate to demand-side factors, Table 2-1 shows selected indicators for Maryland and the set of comparison states used in Chapter 1. The per capita spending figures for 2004, also from Chapter 1, are repeated in the top row of the table. For 2004, the age distribution in Maryland was not markedly different from the nation as a whole. Maryland had a similar proportion of children

FIGURE 2-6. Cancer Deaths, All Causes, Per 100,000 Population, for Maryland, U.S., and Selected Regions, 1991 to 2004



SOURCE: CDC, Wonder Cancer Statistics, age-adjusted

less than 20 years of age (27.9 percent compared to 27.8 percent) and a slightly lower proportion of persons 65 years of age and over (11.5 percent vs. 12.4 percent). Both of these differences could contribute to lower spending in Maryland, all other things constant. Most of the comparison states were similar in terms of the under-20 population; the lowest proportions were found in Massachusetts and Pennsylvania, and the highest in Colorado. Pennsylvania had the highest proportion of elderly adults—one-third higher than that in Maryland. Only Colorado had a lower proportion.

In terms of both median income and the percentage of persons with incomes below the poverty level, Maryland residents were relatively well-situated throughout the period. In 2004, median income in Maryland was higher than that in all but two states across the nation, and was higher than in all of the comparison states except for New Jersey. While Minnesota's median income was lower than that of Maryland, the percentage of Minnesota families classified as poor was lower than in Maryland. With respect to the level of uninsurance, Maryland fared better than other states, on average, but not to the same degree as for income. For the period from 2002 to 2004, 14 percent of Maryland residents were uninsured; this was close to the proportions for New Jersey and Virginia, but higher than five of the comparison states. Colorado, North Carolina, and Oregon all had a greater proportion of their population lacking coverage; all three of these states also had relatively high percentages of persons below the poverty line.

At 28.9 percent, Maryland ranked fifth in the nation in terms of its African American population and had the highest proportion of African American residents of any of the states shown by a substantial margin. Only three of the states—Delaware (20.1 percent), North Carolina (21.7 percent), and Virginia (19.9 percent)—had a proportion more than half as high. Maryland had a much smaller concentration of Hispanic residents—only 5.4 percent. This is substantially lower than the nation overall (14.1 percent). Among the comparison states, Minnesota, Pennsylvania, and Wisconsin had a lower proportion of Hispanic residents and Colorado, New Jersey, and Oregon to a lesser extent had a substantially higher proportion.

Only 5.2 percent of Maryland residents lived in non-metro areas, placing it 46th in the nation. With the exceptions of Massachusetts and New Jersey, all of the comparison states had a substantially larger share of their residents living in rural areas in 2004.

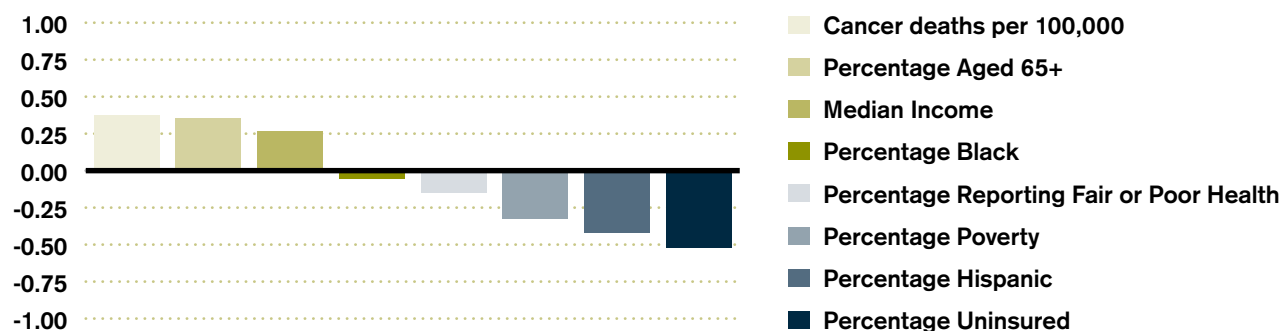
Two health status measures are shown in Table 2-1: the percentage of the population reporting that they are in fair or poor health and the number of cancer deaths per 100,000 population (all causes, age-adjusted). Just over 12 percent of Maryland residents reported fair or poor health status in 2004, placing Maryland 42nd in the nation and 17 percent below the national average. Of the comparison states, Colorado, Minnesota, and Wisconsin were slightly lower. North Carolina was over 50 percent higher and Oregon was 33 percent higher. Maryland ranked 23rd in its cancer death rate, close to the national average. Of the comparison states, only Delaware, North Carolina, and Pennsylvania had higher cancer mortality rates, although rates in Massachusetts, New Jersey, Oregon, Wisconsin, and Virginia were only slightly lower.

Are Demand-Side Indicators Associated with Health Care Spending?

Each of the demand-side indicators discussed above describes some aspect of the population that could potentially be related to health spending. Figure 2-7 shows the level of the association between each of these variables and health spending for 2004. A positive association—meaning that the indicator is higher when spending is higher—would be represented by a bar between 0 and 1, while for a negative association the bar descends below the 0-axis. The larger the bar, or closer to 1 (or -1), the stronger is the association with spending.

In Figure 2-7, the strongest association shown is with the percentage uninsured—the negative value indicates that spending tends to be higher in states where the percentage of the population without coverage is lower, i.e., where a higher proportion of the residents have health insurance coverage. The next strongest association—also negative—is with the proportion of the population that is Hispanic. Spending tends to be higher in states with fewer

FIGURE 2-7. Strength of Association of Selected Demand-Side Indicators with Per Capita Personal Health Spending, 2004



SOURCE: Pearson correlation coefficients, based on data from U.S. Census Bureau, Centers for Disease Control and Prevention, United Health Foundation, and Centers for Medicare & Medicaid Services

Hispanics. There are three indicators that are positively associated with spending—cancer deaths, the percentage of the population that is 65 years of age and older, and median income. While the percentage of the population that is black does not appear to be associated with spending, the underlying story is more complex. The association between spending and the percentage of the population that is black is somewhat larger (approximately 0.2) and positive for states with small concentrations of African Americans, and the same size but negative for states with small numbers of black residents. This suggests that there is an intervening variable—perhaps income that is also strongly associated with the distribution by race and per capita spending.

Because the information presented is based on analysis of the relationship between spending and one factor at a time—without controlling for the effects of other influences—this information does not tell the whole story. However, it is still useful to examine these relationships one-by-one; in Chapter 5, a more comprehensive analysis is used to better understand how these factors work together.

CHAPTER 3

Supply of Health Care Resources and Health Care Spending

The distribution of health care resources—personnel, facilities, and equipment—varies widely across geographic areas in the United States. As with demand-side factors, there are a host of possible influences on supply—consumer preferences and health status; provider choices between work and leisure and between different practice settings; local practice norms that may promote varying approaches to treatment or uses of technology; and policy interventions that limit or facilitate changes in supply. This chapter examines the supply of health resources in Maryland, selected comparison states, and the United States as a whole. Trends are examined for the period from 1990 to 2005. As in the earlier chapters, the emphasis is on understanding variation in supply across states and how those differences may contribute to state variation in health care spending as well as growth in health care spending.

We begin with a brief review of what is known about the relationship between the supply of selected health care resources and health care use and spending. Data documenting how Maryland fares relative to other states in terms of the health resources are explored and associations between selected supply-side factors and per capita spending are presented.

How Does Supply Affect Health Care Spending?

The supply of health care services encompasses a broad range of personnel, facilities, and equipment. Personnel include physicians of all specialties, nurse practitioners, physician assistants, registered nurses and licensed practical nurses, home health aides, dentists, pharmacists, chiropractors, podiatrists, and so on. Facilities include general short-stay hospitals, psychiatric hospitals, skilled-nursing facilities, and long-term-care facilities, among others, usually measured by the number of beds. There are also ambulatory surgery centers, other ambulatory care

outlets such as community health centers (CHCs), urgent care centers, and, more recently, retail clinics, and free-standing or hospital-based entities offering specialized services such as imaging. Even measuring all of these different dimensions of supply, and understanding the relationships among them—whether they are used as substitutes or complements to each other—is a daunting task.

The health services research literature has tended to focus primarily on the supply of hospital beds and physicians in investigating the relationship between health care spending and the supply of health care resources.²⁵ As described in Chapter 2, geographic variation in health care spending in part reflects differences across states in population demographics, socioeconomic characteristics, and health status. These same characteristics may influence the supply of health care services—if a population is sicker, then it would require more health care providers; if a population has higher income then it may choose to consume more health care.

One of the aspects of the health care sector that is somewhat unique, however, is the potential role that supply may play in driving demand. It has long been hypothesized that physicians, in particular, and other suppliers of health care services more generally may be able to influence the demand for health care in ways that are not possible for the producers of other goods and services. The notion is that areas with

²⁵ Studies examining use of services and spending for the Medicare population have found positive relationships between the probability of hospitalization for medical (non-surgical) conditions and the number of hospital beds per capita; the number of visits (by physician specialty) and the number of physicians of that specialty per capita; and the percentage of physicians who are specialists and higher overall Medicare spending. Center for the Evaluative Clinical Sciences. 1999. *The Quality of Medical Care in the United States: A Report on the Medicare Program*, www.dartmouthatlas.org/atlas/99Atlas.pdf. Also Supply-Sensitive Care, 2007, A Dartmouth Atlas Project Topic Brief, www.dartmouthatlas.org/topics/supply_sensitive.pdf.

more physicians may have higher spending because physicians “induce” demand—that is, they may recommend more followup care, order more tests, or prescribe more medications than what might be deemed medically necessary.

But supply can also have the effect of limiting utilization and possibly spending, if there is a lack of capacity. If there are too few hospital beds or an insufficient number of primary care physicians, it is generally difficult in the short run to increase supply substantially. In the face of inadequate supply, higher demand may drive up short-term prices and create access to care problems or ‘queueing’ for services. For many years, geographic areas with health personnel shortages have been designated by the federal government (as well as state governments) as a source of policy concern.

In addition to the level of resource availability, the mix of resources—in combination with local practice patterns—has an important influence on spending. Under certain circumstances, different types of health care providers can serve as substitutes and the package of care provided will have different associated costs—an inpatient stay in a small community hospital vs. a large teaching hospital; a surgical procedure performed in an inpatient hospital setting or on an outpatient basis; an ambulatory visit with a primary care physician in an office-based setting versus a visit with a nurse practitioner in a retail clinic. To add a greater layer of complexity, over a longer time horizon there is also the potential for substitution between a preventive visit to a primary care physician (perhaps for glucose monitoring) and a surgical procedure performed by a specialist physician (for a limb amputation).

Researchers continue to explore the relationship between supply and spending and studies have become more nuanced over time, focusing on particular more narrowly-defined components of supply and associated spending. There is some recent empirical evidence—focused exclusively on the Medicare population—that the percentage of physicians who are specialists is strongly associ-

ated with higher spending.²⁶ Other studies have found that geographic areas with for-profit hospitals have higher Medicare costs than areas with nonprofit hospitals.²⁷ Results from another study suggest that rates of cardiac surgeries grew faster in areas with cardiac specialty hospitals than in other areas, and that the costs associated with these specialty hospitals were higher.²⁸ These more focused studies, to some extent, help to avoid the tautology that there is more spending where more services are provided.

Recent attention in Maryland—prompted by the Legislature’s interest in expanding access to primary care—has focused on issues related to physician supply. The Task Force on Health Care Access and Reimbursement, established through the passage of Senate Bill 107 during the 2007 Maryland General Assembly’s Legislative Session, examined a variety of issues related to health care access and provider reimbursement, and spent considerable time analyzing physician supply issues. The Maryland Hospital Association (MHA)/MedChi work force study for Maryland reported long-term deficits in physician supply, but highlighted immediate shortages in rural areas. Several Task Force recommendations were aimed at addressing supply problems related to primary care physicians.

Several legislative initiatives have responded to these recommendations. The 2009 SB 627 authorized a new physician loan repayment program that would enable physicians practicing in a variety of care settings (private practice, community health center, hospital-based, or local government) to receive loan repayment assistance for practicing in a state-defined health personnel shortage area. In the 2010 legislative session attempts are being made to begin to eliminate disparities in clinical earnings in primary

²⁶ Center for the Evaluative Clinical Sciences. 1999. *The Quality of Medical Care in the United States: A Report on the Medicare Program*, www.dartmouthatlas.org/atlas/99Atlas.pdf. Also, see Baicker K and Chandra A. “The Productivity of Physician Specialization: Evidence from the Medicare Program,” *American Economic Review*, vol. 94, no. 2, pp. 357–361.

²⁷ Dartmouth Medical School. “For-Profit Hospital Ownership Means Higher Costs, Dartmouth-VA Study Finds.” Press Release—August 4, 1999. <http://dms.dartmouth.edu/news/1999/4aug1999.shtml>.

²⁸ Medicare Payment Advisory Commission. “Report to the Congress: Physician-Owned Specialty Hospitals Revisited.” August 2006. <http://www.asipp.org/documents/PhysicianOwnedSpecialtyHospitals.pdf>.

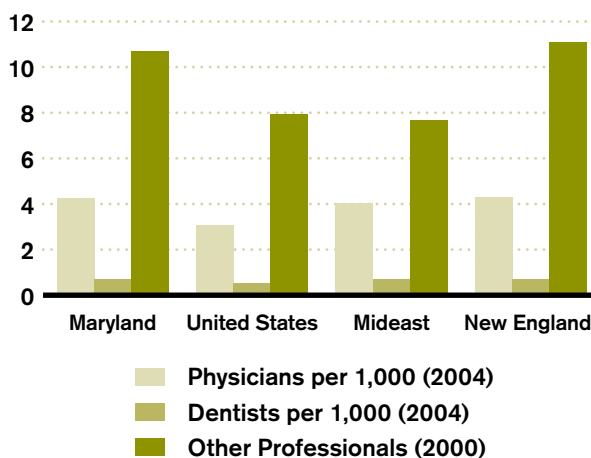
care and secondary care by considering additional payments for primary care practices that offer after-hours care (HB 435). Some policymakers are also examining opportunities to develop postbaccalaureate programs for minorities and less advantaged individuals to prepare for medical school; these programs would provide financial incentives for primary care training in Maryland. In 2010 the legislature will also consider supporting innovations in advanced primary care such as 'medical home' pilots (HB 929).

How Does Maryland Compare to Other States on Supply-Side Indicators?

The measures of health care resources presented here are limited, given the large number of different types of health care professionals and the growing array of facilities and specialized services. On the most widely used measures, Maryland is above the national average on physician supply but below on hospital beds. In 2004, Maryland had 4.28 physicians per 1,000 population, placing it 3rd in the country as a whole and almost 40 percent above the national average (see Figure 3-1). Although there are different approaches to measuring physician supply and issues associated with accurate measurement, the numbers presented allow study of the variation across states. The states with the lowest number of physicians per population were Mississippi and Idaho, at 2 physicians per 1,000 population. Massachusetts was highest, with 4.88 physicians per 1,000 population.

The number of dentists practicing in Maryland, on a population basis, was also above the national average; in 2004, Maryland had 0.71 dentists per 1,000 population compared to a national average of 0.57. The states with the lowest dentist-to-population ratio were New Mexico (0.37), Mississippi (0.38), and Arkansas (0.38). With respect to other health care professionals—defined here as registered nurses (RNs), licensed practical nurses (LPNs), and physician assistants (PAs)—Maryland had almost 10.7 per 1,000 population in 2005 placing it over 30 percent above the national average (7.9). Compared to states located geographically near Maryland, Maryland had a similar supply of physicians and dentists per 1,000 population; the supply of

FIGURE 3-1. Supply of Physicians, Dentists, and Other Health Care Professionals, Maryland, U.S., and Selected Regions



Other health care professionals for 2000 includes RNs, LPNs, and PAs.

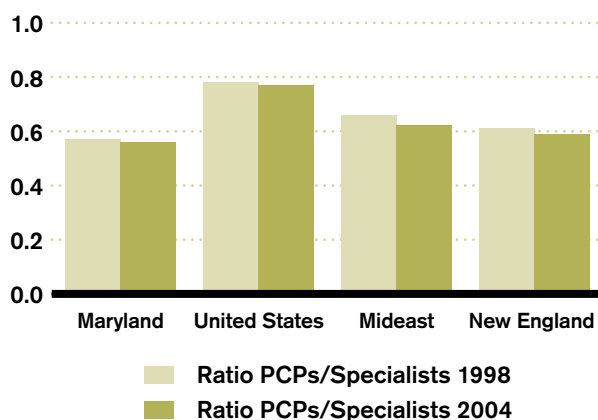
SOURCE: AMA Physician Masterfile, 2004; Area Resource File

nurses and PAs was slightly lower than that in the New England states but higher in Maryland than in the Mideast states.

Maryland's overall physician-to-population ratio is relatively high, but the mix of physicians—compared to the other states—is tilted toward specialists, with Maryland third among the 50 states in terms of the proportion of specialist physicians.²⁹ In 2004, 35.9 percent of Maryland physicians were primary care physicians (PCPs); in contrast, the average across the United States was 43.4 percent, putting Maryland 17 percent below the national average. The proportion of primary care physicians in Maryland, while lower than the national average, is closer to that in the Mideast and New England regions (38.1 and 37.3 percent, respectively). In general, states with larger rural areas tend to have higher proportions of primary care physicians—the primary care share

²⁹ Estimates of FTE physicians produced by the Maryland Hospital Association found significantly a lower number of physicians per capita. The MHA and the Medical Society argue that physician body counts overstate actual supply in Maryland because many Maryland physicians are engaged in research with medical institutions and the federal government in addition to providing patient care. Estimates of FTE physicians for the United States and comparison states have not been completed, so comparison between Maryland and other jurisdictions based on such estimates are not feasible.

FIGURE 3-2. Ratio of Primary Care to Specialist Physicians, Maryland, U.S., and Selected Regions, 1998 and 2004

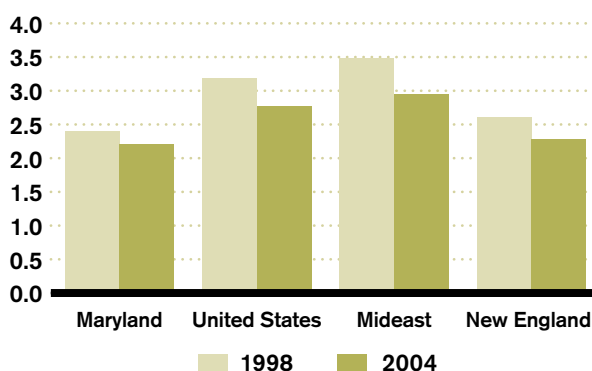


SOURCE: AMA Physician Masterfile, 2004; Area Resource File

in Alaska was 64.6 percent, in Wyoming and North Dakota it was about 58 percent. Massachusetts had the lowest primary care percentage in the country at 33.5 percent. Figure 3-2 shows the ratio of primary care physicians to specialist physicians; between 1998 and 2004 this ratio fell slightly (2 percent) across the country. In Maryland, the ratio declined by 2.6 percent and in the Mideast region it fell by 5.7 percent.

With respect to hospital beds, Maryland had 2.21 beds per 1,000 population (short-term general hospitals) in 2004. Maryland's rate was 20 percent lower than the national average of 2.77 and lower than the average in the Mideast and New England regions (see Figure 3-3). In the period from 1998 to 2004, the number of hospital beds dropped across the country—on a population basis hospital beds declined almost 13 percent. The number of hospital beds per 1,000 population declined somewhat less in Maryland (8 percent), but Maryland still had fewer beds per capita than the nation overall. Maryland was also somewhat low in terms of nursing facility beds; here, we include beds in skilled-nursing facilities (SNFs) and in other nursing facilities. Maryland had 5.2 nursing facility beds per 1,000 population, compared to 6.3 in the Mideast region and 7.7 in New England. The national average was 5.9 nursing beds.

FIGURE 3-3. Hospital Beds per 1,000 Population, Maryland, U.S., and Selected Regions, 1998 and 2004



SOURCE: AHA Survey Database, 2004; Area Resource File

For certain population groups that may not have access to office-based physicians, primary care services are often delivered in federally qualified health centers (FQHCs) and rural health clinics (RHCs). While there are other sources of care, the number of FQHCs and RHCs per 1,000 population is another indicator of the availability of primary care services. Maryland had 28 FQHCs or .005 of these providers per 1,000 population in 2005; this was slightly less than in the Mideast region (.007) and about one-third of that in New England (.015). The national average was even higher at 0.22.

Health Care Resources: Comparisons Between Maryland and Selected States

Table 3-1 provides information on supply-side indicators in Maryland and 10 comparison states. As noted above, in 2004, the number of physicians practicing in Maryland was substantially above the national average on a population basis. In terms of the proportion of physicians that were primary care, Maryland's 35.9 percent was the lowest among the comparison states, with the exception of Massachusetts (33.4 percent). All of the other comparison states were substantially higher—in Minnesota and Wisconsin, the proportion of primary care physicians was at or over 50 percent. Maryland had the lowest number of FQHCs and RHCs on a population basis (.005 per 1,000 population). The

TABLE 3-1. Supply-Side Indicators for Maryland Compared to the National Average and Selected States

	MARYLAND	MARYLAND RANKING AMONG THE 50 STATES	NATIONAL AVERAGE	COLORADO	DELAWARE	MASSACHUSETTS	MINNESOTA	NEW JERSEY	NORTH CAROLINA	OREGON	PENNSYLVANIA	VIRGINIA	WISCONSIN
PER CAPITA SPENDING, 2004	\$5,590	17	\$5,283	\$4,717	\$6,306	\$6,683	\$5,795	\$5,807	\$5,191	\$4,880	\$5,933	\$4,822	\$5,670
Physicians per 1,000 population,	4.28	3	3.08	3.00	3.01	4.88	3.15	3.70	2.79	3.10	3.73	2.94	2.86
Primary care physicians as percentage of total*	35.9%	48	43.4%	45.7%	42.0%	33.5%	52.7%	39.2%	44.1%	45.7%	40.4%	44.9%	50.0%
Dentists per 1,000 population	0.71	–	0.57	0.62	0.42	0.80	0.61	0.76	0.42	0.57	0.64	0.54	0.56
Other health care professionals, 2000*	10.7	–	7.9	7.4	11.7	12.6	7.8	10.7	7.4	6.1	11.1	8.2	3.1
Federally qualified health centers and Rural health centers per 1,000 population, 2005	.005	49	.022	.019	.008	.008	.028	.006	.021	.028	.014	.016	.019
Hospital beds, short-term general, per 1,000 population	2.21	39	2.77	1.95	2.32	2.36	3.17	2.53	2.88	1.91	3.12	2.48	2.64
Skilled-nursing facility and nursing facility beds, per 1,000 population, 2005	5.2	33	5.9	4.3	5.5	7.9	7.1	5.9	5.0	3.5	7.2	4.2	7.0

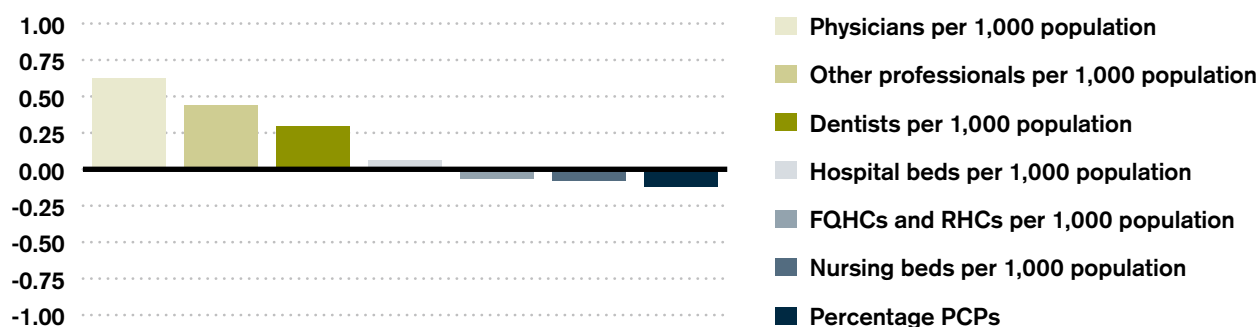
Data are for 2004 unless otherwise noted.

* Primary care physician count Includes obstetrician/gynecologists.

** Other health care professionals defined as RNs, LPNs, and PAs.

SOURCE: See Appendix.

FIGURE 3-4. Strength of Association of Selected Supply-Side Indicators with 2004 Per Capita Personal Health Spending



NOTE: Correlation for other professionals is based on 2000 data.

SOURCE: Pearson Correlation Coefficients, based on data from 2008 Area Resource File.

closest of the comparison states were New Jersey (.006), Delaware (.008), and Massachusetts (.008). Minnesota and Oregon had the most of these health centers per population (.028).

Maryland's supply of dentists and selected other health professionals³⁰—specifically, nurses and physician assistants—was high relative to the national average and most comparison states. In 2004, Maryland had 0.71 dentists per 1,000 population; among the comparison states, only Massachusetts (0.80) and New Jersey (0.76) had a higher number of dentists per capita. In some settings, the supply of other health professionals, such as nurses and PAs, can substitute for more costly physician labor. Maryland had 35 percent more of these health professionals per capita than the national average, and more than in any comparison state except Delaware, Massachusetts, and Pennsylvania. Maryland's supply of those health professionals was very similar to that in Delaware and Pennsylvania, as well as in New Jersey.

Maryland had relatively few hospital beds compared either with the national average or most other comparison states. In 2004, Maryland averaged 2.21 beds per 1,000 population in short-term general hospitals, 20 percent less than the national average, and less than in all comparison states except Colorado and Oregon.

³⁰ The most recent data available for nurses and PAs are from 2000.

Are Supply-Side Indicators Associated with Health Care Spending?

As described above, the supply of health care resources can affect expenditures for health care services. Figure 3-4 shows the level of the association between the supply-side indicators physician and per capita total spending, estimated across all states in 2004. As explained in prior chapters, a positive association—meaning that the indicator is higher when spending is higher—is represented by values between 0 and 1; the larger the bar, or closer to 1, the stronger is the association with spending.

This analysis is based on examining the relationship between spending and one factor at a time and does not control for the effects of other influences. Because of the many interconnections and time lags, this is only a small part of a complex picture but does provide some initial information about how these different forces relate to spending. This analysis addresses only the strength of the association; the statistical significance of these relationships is addressed in Chapter 5.

The association between physician supply and spending is positive and relatively strong. This is not surprising, given that physicians are central and essential to health care delivery. The supply of other health care professionals—the nurses and physician assistants that work with physicians or substitute for some physician activities—is also fairly strongly

associated with spending. The association of dentists is positive but modest, and the supply of hospital beds has only a weak association. The remaining variables also have relatively weak and negative associations; of interest, states with a higher proportion of the physician workforce represented by primary care physicians tend to have lower spending. As noted earlier, many of these are more rural states, another factor associated with lower spending.

CHAPTER 4

Health Care Markets, Policy, and Health Care Spending

The demand for and supply of health services interact in a market that is unique in several ways—including the extent of government intervention through its role in financing and regulation; the influence exerted by physicians (the suppliers of health care) on demand for services; and the impact of third-party payment or insurance coverage on the prices facing both consumers and providers. Thus, an analysis of health care spending by necessity must consider the complicated market environment and policy climate in which health care is delivered, including the health insurance market. Within health care markets, both public and private forces operate on the national, state, and local levels to influence the price, availability, and attributes of health care services. In this chapter, some specific characteristics of the policy and market environments are enumerated and their potential impact on spending is described.

An Overview of Policy Interventions and Market Characteristics

The market environment is shaped by the demand and supply factors described in previous chapters as well as by policy and regulatory forces that collectively affect health care spending in a variety of direct and indirect ways. These initiatives can impact the level of resources available to providers or consumers, or the particular mix of services available.

Some of these policies are enacted at the state level, and so may contribute directly to geographic variation in health spending. However, even federal initiatives may have disparate geographic impacts—for example, provision of funds to support graduate medical education through Medicare varies geographically with the location of teaching hospitals. While policy actions may influence health care markets, regional and local economic conditions—the wages of health care professionals and the presence of alternative

providers, for example—also play a role. In this section, specific public policy interventions in the health care market and other market characteristics are discussed as they may affect spending for health care services.

Public Policy Interventions

In this section, a number of specific public policy measures are described. These interventions may directly affect the provision of health care services (hospital rate regulation, Certificate of Need programs, and medical malpractice reform) or their immediate impact may be felt in the market for health insurance (mandated benefits, small group/individual market reforms, and high-risk pools) which in turn affects the health care services market. Several aspects of government policies that affect spending through public financing initiatives are also described.

HOSPITAL RATE REGULATION. In order to restrain health care spending, states may directly intervene by regulating the rates charged by hospitals. A period of sustained growth in the cost of hospital services prompted seven states to introduce hospital rate-setting in the 1970s and 1980s.³¹ By 1996, only two state programs remained in place—in Maryland and West Virginia. Despite the small number of ongoing programs, a recent analysis concluded that hospital rate-setting programs can be effective in controlling cost growth, though the outcome is highly dependent on the specifics of implementation.

CERTIFICATE OF NEED (CON) PROGRAMS. States may also intervene in markets in ways that directly affect the supply of health care services. The rationale for CON programs—many of which were initially

³¹ Atkinson G., *State Hospital Rate-Setting Revisited, Commonwealth Fund Issue Brief*, October 2009. <http://www.commonwealthfund.org/Content/Publications/Issue-Briefs/2009/Oct/State-Hospital-Rate-Setting-Revisited.aspx>.

enacted as part of federal health planning legislation in 1974—was that increased or excess supply leads to increased use, driving up health care spending. These programs require approval, usually by a planning agency or board, for the construction of new facilities as well as the purchase of selected types of equipment and the provision of specific services. Despite the intention to control spending through limiting excess capacity, the possession of a CON license for an existing highly specialized service—such as open-heart surgery—may confer monopoly status, and increase prices.³² While there is some mixed empirical evidence on the impact of CON, a 2004 report by the Federal Trade Commission and Department of Justice found that CON programs inhibit competitive markets, thereby contributing to rising prices rather than reducing them.³³

MEDICAL MALPRACTICE TORT REFORM. Provider concerns have prompted many states to intervene with regard to the cost of malpractice coverage for health care providers. Providers have argued that rising malpractice insurance premiums compel them to practice ‘defensive medicine,’ ordering unnecessary tests or procedures because of the perceived threat of liability, raising their costs of practice to such an extent that they are unable to continue to offer services. In response, state legislatures have enacted a range of initiatives to cap the amount of medical malpractice claims (often capping punitive and noneconomic damages). The evidence on both the impact of malpractice premiums on health care costs and the impact of legislative reforms on health insurance premiums tends to suggest that the effect on spending is not large. An analysis by the Congressional Budget Office estimated savings from malpractice reform to be only about 0.5 percent or \$11 billion a year at the current level.³⁴ Other analyses have found that the pressure placed on hospitals by

malpractice suits actually increases efficiency,³⁵ and that increases in malpractice premiums are related to the generalized rise in health care costs rather than any real growth in compensatory awards.³⁶

MANDATED BENEFITS. In order to increase the range of covered services to which consumers have access, all 50 states have enacted laws that mandate coverage for specific conditions or treatments, health care providers, or populations. While many of these mandates are popular with consumers, there has been concern that expanding the range of covered services would increase health care spending and raise health insurance premiums. Evidence as to the effect on premiums is mixed. The impact appears to vary by specific mandate, with coverage of some benefits, such as chiropractic services and mental health benefits, having a larger impact on cost. The Congressional Budget Office has estimated an overall increase of 5 percent in premiums, compared to what they would have been without any mandates.³⁷

SMALL GROUP (AND INDIVIDUAL) MARKET REGULATIONS. Within the market for small group or individual insurance policies, many states have enacted legislation that restricts the prices and other attributes of policies. While these initiatives are intended to protect consumers and provide more affordable coverage, by imposing requirements on insurers these rules may cause premiums to rise. The kinds of requirements include such features as guaranteed issue; rate restrictions; bans on exclusions of pre-existing condition; provision of standardized benefit package; and premium subsidies.

³² Solomon LS, “Rules of the Game: How Public Policy Affects Local Health Care Markets,” *Health Affairs* Vol. 17, No. 4, July/August 1998, pp. 140–148.

³³ Federal Trade Commission and Department of Justice, *Improving Health Care: A Dose of Competition*, (Washington D.C.: FTC, DOJ, 2004), www.ftc.gov/reports/healthcare/040723healthcarerpt.pdf.

³⁴ Congressional Budget Office, *Limiting Tort Liability for Medical Malpractice*, Economic and Budget Issue Brief, January 8, 2004. <http://www.cbo.gov/ftpdocs/49xx/doc4968/01-08-MedicalMalpractice.pdf>.

³⁵ Bagga, Shalini. “Medical Malpractice: Examining its Effect on Hospital Efficiency” *Paper presented at the annual meeting of the Economics of Population Health: Inaugural Conference of the American Society of Health Economists, TBA, Madison, WI, USA, Jun 04, 2006* <Not Available>. 2009-05-25 <http://www.allacademic.com/meta/p93477_index.html>.

³⁶ Baicker K and Chandra A. “The Effect Of Malpractice On The Delivery Of Health Care,” *Forum for Health Economics and Policy*, 2005, v8, Article 4, and Chandra, Nundy, and Seabury *Health Affairs* 2005 Jan–Jun; Suppl Web Exclusives:W5-240-W5-249.

³⁷ Congressional Budget Office. “Increasing Small-Firm Health Insurance Coverage Through Association Health Plans and Healthmarts” January 2000 <http://www.cbo.gov/doc.cfm?index=1815&type=0>.

FEATURES OF MEDICAID COVERAGE. Although Medicaid is a public financing program that spans the 50 states, there are state-to-state variations in eligibility, scope of benefits, level of payments to providers, and delivery systems that may result in differences in spending on an aggregate and a per enrollee basis. In recent years as a result of the Children's Health Insurance Program (CHIP) and waivers granted by CMS to allow for program changes, many states cover individuals with incomes as high as 300 percent of the poverty level, adults with no categorical eligibility status, and home care services in lieu of nursing homes. Program variants such as waivers for home- and community-based services must demonstrate that the home-based services are no more costly than the care that would have been received in a nursing home residential setting; thus per enrollee costs should not increase. Other changes may increase total spending. In terms of the payments made on behalf of Medicaid enrollees to health care providers, Medicaid programs also vary across states; this variation may partly reflect geographic cost-of-living differences but is also likely to relate to other aspects of local markets. Federal law requires states to set rates at levels that ensure that Medicaid enrollees enjoy access comparable to that of privately insured individuals in the same community, which will be affected by the relative size of the Medicaid population, as well as private insurers' and providers' relative bargaining power.

STATE HIGH-RISK POOLS. These state programs offer health insurance to individuals who are generally precluded from purchasing affordable coverage due to preexisting health conditions. High-risk pools may vary across states with regard to eligibility criteria, benefit design, premiums and cost-sharing, and preexisting condition exclusions. With a nationwide enrollment of only 200,000 persons³⁸ (representing a very small proportion of all uninsured), these arrangements may have no discernible impact on variation in health care spending unless it is by indirectly decreasing the overall level of risk and costs in the individual health insurance market.

³⁸ Schwartz T, "State High-Risk Pools: An Overview," Kaiser Commission on Medicaid and the Uninsured Issue Paper, January 2010. <http://www.kff.org/uninsured/upload/8041.pdf>.

STATE-LEVEL MEDICARE IMPACTS. Although Medicare is a federal program, changes within the program may affect states differentially and contribute to interstate changes in spending levels. Several major pieces of legislation during the study period changed Medicare payments in ways that increased Medicare spending in some states relative to others. For example, the 1997 Balanced Budget Act lowered Medicare payments for specific services such as home health and nursing home care, so that states with higher shares of Medicare spending devoted to those services (such as Louisiana and Texas) were disproportionately affected.³⁹ In a similar manner, other legislative efforts during this time narrowed the gap in Medicare payments between urban and rural areas, thus having a positive impact on spending in areas with a higher share of rural providers.

Other Market Characteristics

These legislative and regulatory policies shape the health services marketplace directly and through the way that providers compete. Here, market characteristics that influence the supply of and prices of health care services are described.

HOSPITAL COMPETITION AND PRICES. Although the market for physician services tends to be relatively competitive because of the large number of providers, certain hospital markets are less so. Particularly following a wave of hospital consolidation in the latter part of the 1990s, some geographic areas are now dominated by a small number of hospital systems. Competition is traditionally measured by the market shares held by the largest service providers. Lack of competition may be viewed as problematic because of the potential impact on the prices faced by consumers.

Discussions of the demand for and supply of services usually include a mention of the prices of those services. However, identifying the 'price' of health care is not straightforward. The majority of Americans have some sort of health insurance coverage that helps in paying for health care services and thus alters the price paid out-of-pocket by the insured for those services. Even among a group of covered individuals, the price for a given service will vary

³⁹ Martin et al., "Health Spending by State of Residence, 1991–2004." *Health Affairs* 2007.

depending on the type of insurance coverage, the negotiating power of the insurer, the level of benefits of the individual's policy, and so on. Insurers also act to alter the price of services paid to providers, so that the amount charged by providers is frequently not the amount that they are reimbursed. Prices for health care services may vary geographically not only because of the degree of competition among providers, but also due to the interactions with insurers (discussed below).

Rather than using a consumer price, empirical work examining geographic variation has tended to include no price measure at all or some measure of input prices—i.e., the prices paid for the items that go into producing health care. A commonly-used input price is wages for nurses or other health professionals. In analyzing spending variation, using an input price or prices may help to account for the variation that is due to differences in the cost of living across geographic areas. Because the supply of health care services and health care professionals is relatively fixed in the short term, changes in policy or market conditions that affect demand or supply will tend to impact prices and wages.

INSURANCE MARKET CONSOLIDATION AND NEGOTIATED RATES. Health insurance plays a unique role within the health care sector; third-party coverage reduces the out-of-pocket prices paid by consumers for health care services, and negotiations between commercial insurers and health care providers alter the amount that those providers receive as reimbursements. While these negotiated rates are likely to vary geographically based in part on the cost of providing care, negotiated rates are also likely to reflect the market power of insurers relative to providers. Thus, in states with highly concentrated insurance markets, negotiated amounts paid to providers may be somewhat lower than in areas where the insurance market is more competitive. As with hospital competition, measures of the competitiveness of insurance markets are based on the market shares held by the largest insurers. At least theoretically, variation in negotiated rates could be a sound measure of market power; however, this information is considered highly proprietary and is generally not publicly available.

EMPLOYER-PROVIDED COVERAGE—AVAILABILITY AND PREMIUMS. The majority of Americans have employer-provided private health insurance coverage that helps pay for health care expenses, and those

with such coverage spend more on health care services than others with similar characteristics but no insurance. Thus, the availability of such coverage—which varies geographically—may have an impact on health care spending. Spending may also be affected by the level of premiums at which the coverage is available, since the amount of the premium will affect the number of employees who purchase coverage. Local economic and other market characteristics (such as the competitiveness of the insurance market) may have impacts on both the employer offer rate ⁴⁰ and premium levels.

ENROLLMENT IN MEDICARE ADVANTAGE (MA) PLANS.

Another aspect of the Medicare program likely to impact spending differentially by state and locality is through Medicare Advantage (MA); this program offers beneficiaries an alternative to traditional Medicare and allows private plans to participate in Medicare. While the vast majority of beneficiaries live in areas where an MA plan is available, because of idiosyncrasies of the program and local norms, enrollment tends to be higher in certain urban areas. Some of the geographic variation is likely due to the availability of these plans in different areas, which is related to the relationship between the cost of offering Medicare benefits and county-level historical payments for traditional Medicare. In historically high-cost areas, it is easier for a health plan to offer a package of benefits that is richer and therefore more appealing to consumers, relative to traditional Medicare.

Because Medicare payments for beneficiaries enrolled in MA plans are higher, on average, than what the program would pay if the beneficiary were enrolled in traditional Medicare, higher MA enrollment may affect overall spending variation. As an additional impact, there is some evidence that increased enrollment in Medicare Advantage has a positive impact on increasing HMO penetration in the non-Medicare market.⁴¹

⁴⁰ The offer rate is the percentage of employees who work where insurance is offered. From <http://www.ahrq.gov/research/emspria/emspria.pdf>.

⁴¹ Solomon LS, "Rules of the Game: How Public Policy Affects Local Health Care Markets." *Health Affairs* vol. 17, No. 4, 1998.

How Does Maryland Compare to Other States in Terms of Market Environment?

PUBLIC POLICY INTERVENTIONS. As noted in Chapter 1, Maryland is unique in its hospital rate-setting history. While a small number of other states—Connecticut, Massachusetts, New Jersey, New York, Washington, and West Virginia established rate-setting programs in the 1970s and early 1980s—only Maryland and West Virginia still maintain these programs. Four of the states had terminated their program within a year of the study period for this report (i.e., by 1992); the program in Connecticut ended in 1994 and in New York in 1996.⁴²

Maryland was among the earlier states to adopt Certificate of Need (CON) requirements, and one of 36 states that currently maintains a program. Each state regulates different services under its CON program—Maryland requires approval for 19 different types of facilities or services. This places Maryland 19th among the 50 states in terms of the number of different services or facilities for which CON approval is needed. The average across all states, for those with a program, is 17. CON programs are intended to support planning and coordination in order to minimize excess capacity. If the supply of health care services fuels demand, as some contend, then states with more extensive CON programs might have lower spending; however, if these programs simply hold down needed supply, then this might drive prices higher and increase spending.

Another area of fairly widespread public policy intervention relates to medical malpractice legislation, which may affect the market for physician services. Since 1975, 32 states have enacted legislation limiting the amount of malpractice awards for noneconomic damages.⁴³ During the entire study period 1991 to 2004, 18 states—including Maryland—had such a law in force.

⁴² Atkinson G., *State Hospital Rate-Setting Revisited*, Commonwealth Fund Issue Brief, October 2009. <http://www.commonwealthfund.org/Content/Publications/Issue-Briefs/2009/Oct/State-Hospital-Rate-Setting-Revisited.aspx>.

⁴³ Encinosa WC and Hellinger FJ, "Have State Caps on Malpractice Awards Increased the Supply of Physicians?" *Health Affairs* 31 May 2005.

As of 2010, 34 states, including Maryland, had high-risk pools. In terms of the pools' features, Maryland was among 15 states offering premium subsidies to enrollees and had one of the less restrictive exclusion periods for preexisting conditions (2 months compared to an average of 6.8 months). Enrollment in Maryland's high-risk pool was just over 15,000 persons.⁴⁴

Many states also have regulations that target the small-group and individual health insurance markets. All states currently require guaranteed issue; Maryland is one of 37 states that do not extend this protection to self-employed groups of one. For individuals who are not HIPAA-eligible,⁴⁵ Maryland, along with 36 other states, offers portability of individual coverage, allowing persons to avoid permanent exclusion for preexisting conditions. Maryland is also 1 of 24 states that requires insurers to offer a standardized plan in the small-group market and is 1 of only 8 states offering premium subsidies in that market. Maryland's subsidy program, the Health Insurance Partnership, is limited to employers with 2–9 employees who meet additional criteria.⁴⁶

State-level regulations may affect health insurance policies available in the state by mandating coverage of specific benefits. The extent of required coverage and the definition of the service may vary, making it difficult to compare across states; adding to the complexity, mandates also vary across the large and small-group markets and may vary across different types of products. According to one recent compilation of state mandate information for the small-group and individual markets, in 2009, only 4 states (Alabama, Hawaii, Idaho, and Utah) had fewer than 25 mandates in place, and Maryland was among

⁴⁴ Schwartz T, "State High-Risk Pools: An Overview," Kaiser Commission on Medicaid and the Uninsured Issue Paper, January 2010. <http://www.kff.org/uninsured/upload/8041.pdf>.

⁴⁵ HIPAA-eligible refers to the Health Insurance Portability and Accountability Act of 1996. Individuals who meet certain criteria (primarily having to do with prior health insurance coverage) are HIPAA-eligible, guaranteeing them the right to purchase some form of individual insurance coverage without preexisting condition exclusions.

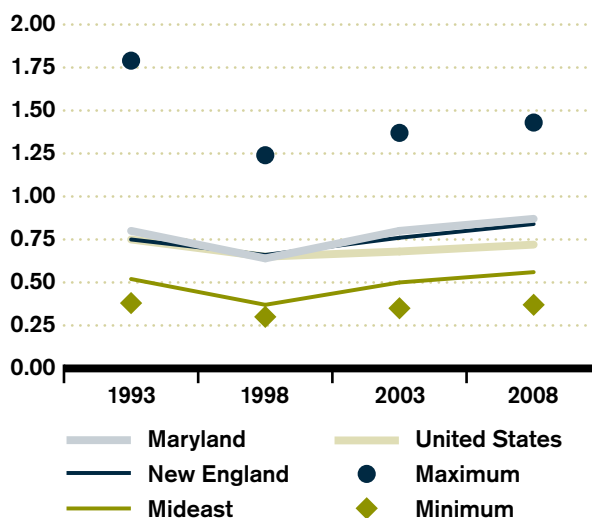
⁴⁶ The Health Insurance Partnership is for employers who: have 2–9 full-time employees; have been in business at least 1 year; are not currently offering employer-sponsored group insurance; and have an average annual wage of less than \$50,000.

27 states that had more than 40 active mandates.⁴⁷ According to this analysis, there are 4 mandates estimated to have the largest impact on premium costs—coverage of in vitro fertilization (covered by 15 states), mental health parity (47 states), prescription drugs (3), and dental services (34). Maryland's mandated benefits include in vitro fertilization and mental health parity; prescription drug coverage is not mandated although there are requirements about the coverage if it is offered.⁴⁸

The large number of different paths to eligibility as well as differences in benefits and payment rates within each state Medicaid program makes it difficult to compare states at a high level. (For example, Maryland has over 20 different Medicaid eligibility categories.) Two measures are used here that provide a general basis for comparison. The first is the ratio of Medicaid enrollees to persons with incomes less than the poverty level. While not all Medicaid enrollees are poor and not all poor are eligible for Medicaid, this ratio provides a crude approximation of the 'generosity' of eligibility criteria and enrollment policies that can be readily compared across states. Using this measure for 2004, the ratio for Maryland is 1.00, i.e., the number of Medicaid enrollees in the state is roughly equal to the number of persons living below the federal poverty line. Thirty-four states had ratios higher than Maryland's, suggesting a somewhat broader eligibility reach; Vermont and Delaware had the highest ratios (1.78 and 1.76, respectively) and Nevada and Montana the lowest (0.66 and 0.67, respectively).

A second measure focuses on the level of provider payment rates—specifically the ratio of Medicaid physician fees to Medicare fees (shown in Figure 4-1). While generous benefit packages and eligibility rules may attract relatively more people to enroll in Medicaid, their ability to get needed care may be strongly influenced by their state's provider payment rates. This particular measure captures the generosity of Medicaid payments relative to those of Medicare in the state. To the extent that physicians have historically viewed Medicare rates as low but acceptable, they may be less likely to participate in

FIGURE 4-1. Ratio of Medicaid Physician Fees to Medicare Fees, for Maryland, U.S., and Selected Regions, 1993, 1998, 2003, and 2008



SOURCES: Zuckerman S. "Trends in Medicaid Physician Fees, 2003-2008," *Health Affairs* (2009)
 Zuckerman S and Norton S. "Trends in Medicaid Physician Fees, 1993-1998," *Health Affairs* (2004)
 Zuckerman et al. "Trends: Changes in Medicaid Physician Fees, 1998-2003. Implications for Physician Participation," *Health Affairs* (2004)
 Norton S. "Medicaid Fees and the Medicare Fee Schedule: An Update," *Health Care Financing Review* (1995)

Medicaid in states where Medicaid rates are even lower than Medicare's, as indicated by a value below 1.0 in this index. Compared to states in the Mideast region, Maryland's payment rates have been relatively higher in the period from 1993 to 2008. Maryland's rates are comparable to the average across the New England states and similar to the U.S. average in the 1990s but higher in 2003 and 2008. Alaska's rates are highest throughout the period, and 30 percent higher than the next highest state in 2003. The lowest ratio for 2003 was in New Jersey at 0.35.

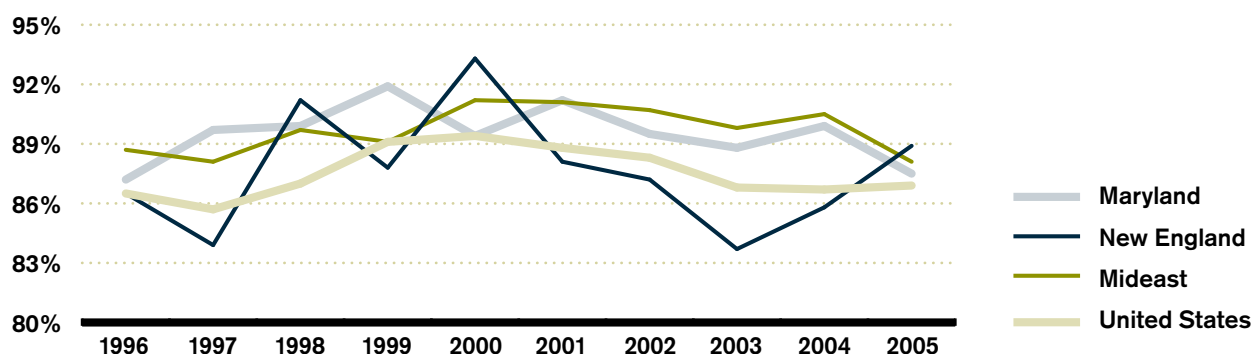
OTHER MARKET CHARACTERISTICS. The level of concentration in the market for hospital services, i.e., market shares by the largest hospitals, is measured at the county level, for those persons living in a county with at least one hospital.⁴⁹ More concentrated markets are less competitive, meaning that hospitals

⁴⁷ Bunce VC and Weiske JP, *Health Insurance Mandates in the States, 2009*, Council for Affordable Health Insurance.

⁴⁸ Maryland Insurance Administration, <http://www.mdinsurance.state.md.us/sa/documents/MarylandMandatedBenefits09-09rev.pdf>.

⁴⁹ The measure is based on the methods used in Wong HS, Zhan C, and Mutter R. "Do Different Measures of Hospital Competition Matter in Empirical Investigations of Hospital Behavior?" *Review of Industrial Organization* 26:61-87, 2005. <http://www.ahrq.gov/news/pubcat/pubcat.htm>.

FIGURE 4-2. Percentage of Private Sector Employees in Establishments Offering Health Insurance, for Maryland, U.S., and Selected Regions, 1996–2005



SOURCE: Medical Expenditure Panel Survey—Insurance Component, 1995–2005

may have greater control over prices, potentially contributing to higher spending. In 2003, hospital services in Maryland were fairly highly concentrated—almost three-quarters of Maryland residents lived in a county where there was a high degree of concentration. The remainder of Maryland residents (28 percent) lived in areas characterized by a low level of concentration. This placed Maryland 33rd in the country in terms of the proportion of its residents living in a highly-concentrated hospital market. Arizona had the smallest proportion of residents living in counties with a high degree of concentration (23 percent) and the highest proportion of residents living in counties with a low degree of concentration (61 percent). For 20 states, all residents lived in areas with highly concentrated hospital markets.

Private health insurance markets in the United States are characterized by a relatively high degree of concentration; using measurement guidelines from the Federal Trade Commission and Department of Justice,⁵⁰ 95 percent of metropolitan statistical areas (MSAs) across the United States were highly concentrated in 2005. A similar analysis of insurance competition at the state level concluded that all but 5 states (of the 48 for which there are data) were “highly concentrated,” and none were considered “not concentrated.”⁵¹ Maryland was 30th of the 48 states (ranked from most concentrated to least). The state with the lowest measured level of concentration

was Wisconsin, and the state deemed most highly concentrated was North Dakota. The concentration of insurance markets bears on health spending in at least two ways. It affects the number and mix of insurance options available to purchasers, with fewer and more costly options likely to be available in a more concentrated market. In addition, insurers with greater market power may be able to negotiate larger discounts with respect to payments to providers. If these savings are passed on to consumers through lower premiums, health spending may be reduced.

Additional data are available that further characterize the market for employer-provided health insurance. In terms of the percentage of private sector employees working at establishments offering health insurance in 2004, Maryland was 8th highest, with 89.9 percent of employees in Maryland’s private sector establishments having health insurance available to them through their jobs. This offer rate was about 4 percent above the national average (see Figure 4-2). The state with the greatest availability of employer-provided insurance was Hawaii (97.5 percent), which has had an insurance mandate on employers since the 1970s, and the state with the fewest private establishments offering coverage was Montana (68.0 percent). With respect to premiums, the average 2004 premium for single coverage in Maryland was \$3,721 and the average premium for family coverage was \$9,855. These premiums placed Maryland close to the middle of all states, and not statistically different than the national average(s). For single coverage, average premiums in Alaska were highest (\$4,379) and

⁵⁰ FTC/DOJ Announce Revised Guidelines on Efficiencies in Mergers” <http://www.ftc.gov/opa/1997/04/effpress.shtm>.

⁵¹ American Medical Association, *Competition in Health Insurance: A Comprehensive Study of U.S. Markets*, 2005 Update.

TABLE 4-1. Policy and Market Indicators for Maryland Compared to the National Average and Selected States

	MARYLAND	MARYLAND RANKING AMONG THE 50 STATES	NATIONAL AVERAGE	COLORADO	DELAWARE	MASSACHUSETTS	MINNESOTA	NEW JERSEY	NORTH CAROLINA	OREGON	PENNSYLVANIA	VIRGINIA	WISCONSIN
PER CAPITA SPENDING, 2004	\$5,590	17	\$5,283	\$4,717	\$6,306	\$6,683	\$5,795	\$5,807	\$5,191	\$4,880	\$5,933	\$4,822	\$5,670
PUBLIC POLICY INTERVENTIONS													
Hospital rate-setting	Y	na	na	N	N	(Y: 1974-1992) N	N	(Y: 1974-1992) N	N	N	N	N	N
Certificate of need													
▪ Duration (1991–2004: All, None, Part)	All	na	na	None	All	All	None	All	All	All	Part	All	Part
▪ Number regulated services (2009)	19	19	12	0	9	17	0	13	28	2	0	22	4
Cap on malpractice awards, noneconomic damages (1991–2004: All, None, Part)	All	na	na	All	None	All	None	None	None	Part	None	All	All
Level of mandated benefits (2009)	High	3	High	High	Medium	High	High	High	High	Medium	High	High	Medium
Small group regulations													
▪ Standardized plan required (2009)	Y	na	na	Y	Y	Y	N	Y	N	Y	N	Y	N
▪ Premium subsidies (2009)**	Y	na	na	N	N	N	N	N	N	N	N	N	N
▪ Guaranteed issue for self-employed group of 1	N	na	na	Y	Y	Y	N	N	Y	N	N	N	N
▪ Individual market portability	Y	na	na	Y	Y	N	N	N	Y	N	Y	Y	Y
▪ High risk pool	Y	na	na	Y	N	N	Y	N	Y	Y	N	N	Y
Medicaid program features													
▪ Ratio of Medicaid enrollees to # poor (2004)	1.00	37	1.11	0.88	1.76	1.48	1.43	1.08	0.97	0.79	1.31	0.89	1.10
▪ Ratio of Medicaid to Medicare fees (2003)	0.80	25	0.69	0.74	1.01	0.80	0.79	0.35	0.97	0.86	0.52	0.87	0.77

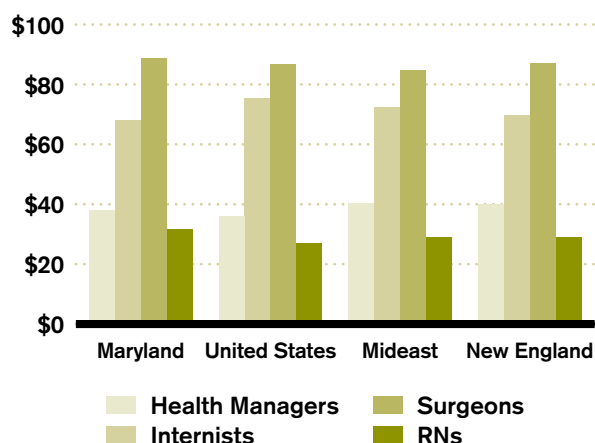
TABLE 4-1. Continued

OTHER MARKET CHARACTERISTICS													
	MARYLAND	MARYLAND RANKING AMONG THE 50 STATES	NATIONAL AVERAGE	COLORADO	DELAWARE	MASSACHUSETTS	MINNESOTA	NEW JERSEY	NORTH CAROLINA	OREGON	PENNSYLVANIA	VIRGINIA	WISCONSIN
Percentage of population living in county with highly concentrated hospital market	72%		na	86%	100%	56%	77%	84%	100%	100%	71%	98%	83%
Insurance market concentration (2005)* ▪ # small group carriers	High 16	30 16*	28*	Medium 27	High 16	High 25	High 11	Medium 16	High 32	High 12	Medium na	High 45	Medium 50
Hospital expenses per inpatient day, 2004	\$1,720	7	\$1,450	\$1,699	\$1,563	\$1,723	\$1,203	\$1,691	\$1,226	\$1,977	\$1,394	\$1,352	\$1,380
Mean nurse hourly wages, 2004	\$31.61	2	\$26.35	\$26.45	\$27.63	\$30.83	\$28.36	\$29.71	\$24.26	\$28.07	\$25.80	\$25.64	\$25.82
Percentage of employees in private sector establishments offering insurance, 2004	89.9%	8	86.7%	85.8%	91.1%	92.4%	88.3%	90.6%	84.7%	80.2%	92.6%	90.6%	86.6%
Premiums ▪ Single coverage ▪ Family coverage	\$3,721 9,855	23 29	\$3,705 10,006	\$3,684 10,228	\$3,830 10,589	\$4,141 10,559	\$3,809 10,307	\$3,882 11,425	\$3,551 10,241	\$3,706 9,906	\$3,671 9,987	\$3,865 10,230	\$3,927 10,416
Medicare Advantage enrollees as percentage of all Medicare beneficiaries	4.4	32	14.0	26.8	0.8	16.1	18.1	8.1	7.0	32.7	25.2	2.6	9.9

* Data available for only 41 states.

** Subsidies are limited to employers with 2–9 employees who meet additional criteria. For Data Sources, see Appendix

FIGURE 4-3. Mean Wages for Selected Health Care Professionals for Maryland, U.S., and Selected Regions, 2004



SOURCE: Bureau of Labor Statistics, November 2004. Occupational Employment and Wage Statistics

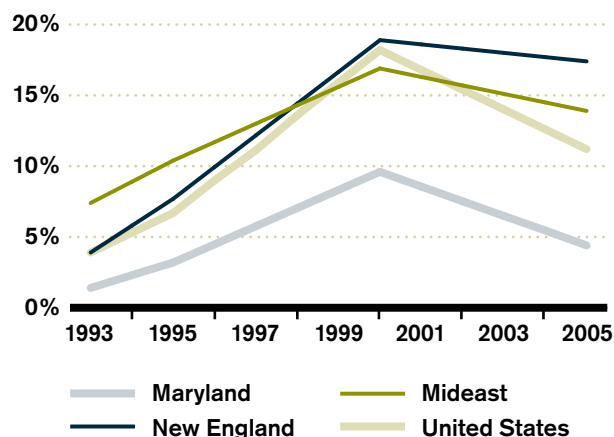
premiums in Utah lowest (\$3,034). New Jersey had the highest average premium for family coverage (\$11,425), with North Dakota lowest (\$7,800).

Largely as a result of the role that third parties play in paying for health services, there is not a simple notion of 'price' for specific services. A single provider accepts different payment amounts from public payers and various private payers for a single service, none of which may be as much as what the provider 'charges' for the service. Nonetheless, it is possible to compare standardized measures of providers' expenses, including wages, to get some sense of the across-state variation in costs and, presumably, prices. One measure of the 'price' of health care is the expense for a hospital inpatient day, as reported here adjusted to include expenses for both inpatient and outpatient hospital care. Maryland's adjusted hospital expenses per inpatient day were \$1,720 in 2004, placing it 7th in the nation, and almost 20 percent above the national average.⁵² (Maryland was 12th highest in 1999, but by 2007 had risen to 5th.)

Another set of prices are the wages paid to health care professionals; these are sometimes referred to as input prices because these are inputs in the

⁵² Kaiser State Health Facts, Hospital Inpatient Day Expenses. <http://www.statehealthfacts.org/comparemaptable.jsp?ind=273&cat=5>.

FIGURE 4-4. Percentage of Medicare Beneficiaries Enrolled in Medicare Advantage Plans for Maryland, U.S., and Selected Regions, 1993–2005



SOURCE: Centers for Medicare & Medicaid Services, Medicare Advantage Enrollment Data, 1993–2005

production of health care. Figure 4-3 shows 2004 mean wages for health managers, two physician specialties—internists and surgeons, and registered nurses. Wages in Maryland were above the U.S. average for three of the four categories. For health managers, Maryland was about 5 percent above the national average though considerably below the average of states in the Midwest and New England regions. While mean wages for Maryland surgeons were slightly above the national average, the mean wage for internists in Maryland was more than 10 percent below the U.S. average. Nurse wages for Maryland were above the United States as a whole by 20 percent and almost 10 percent greater than for New England and the Midwest states.

Enrollment in Medicare Advantage (MA) plans has been relatively low in Maryland. As shown in Figure 4-4, the proportion of Medicare beneficiaries choosing to enroll in an MA plan has been lower than the national average and also lower than in either the Midwest or New England regions between 1993 and 2005.

Health Care Environment: Comparisons Between Maryland and Selected States

Table 4-1 provides information on selected policy and market indicators that may have an impact on state-level health spending. Among the comparison states, Maryland is the only one that currently sets hospital rates, though both Massachusetts and New Jersey had rate-setting programs in place during the late 1970s, throughout the 1980s, and into the very early 1990s. Six of the 10 comparison states have ongoing Certificate of Need programs, with Maryland toward the higher end of those states in terms of the number of facilities and services for which approval is required (19). Only North Carolina and Virginia regulate a larger number of facilities/services (28 and 22, respectively).

In terms of one indicator of legislation related to medical malpractice, Maryland is one of five states included in Table 4-1 that had a cap on noneconomic damages in place throughout the study period, 1991 to 2004. Oregon had such a cap for part of that period, through 1999. Compared to all other states, Maryland has a relatively high number of mandated benefits in place. Among the set of comparison states, only Delaware, Oregon, and Wisconsin were classified as having a medium number of mandated benefits and no states had a low number.

In the small-group market, Maryland has a number of consumer protections in place. Maryland has required insurers to offer a standardized plan with a minimum benefits package since 1994; in 2009, among the comparison states, six states had a similar requirement (Colorado, Delaware, Massachusetts, New Jersey, Oregon, and Virginia) and four did not (Minnesota, North Carolina, Pennsylvania, and Wisconsin). Maryland was the only one in this group of states to offer premium subsidies in the small-group market, albeit to a subset of the market.⁵³ While all states offered guaranteed issue in the small-group market, Maryland did not extend this requirement to self-employed groups of one, as did four of the comparison states (Colorado, Delaware, Massachusetts, and North Carolina). Maryland did

require individual market portability for non-HIPAA-eligible persons along with six other states in the comparison group (Colorado, Delaware, North Carolina, Pennsylvania, Virginia, and Wisconsin). Maryland also operates a high-risk pool, for individuals whose preexisting medical conditions make it difficult to purchase affordable insurance. Five of the comparison states also have a high-risk pool.

Using the ratio of Medicaid enrollees to the number of poor as a rough measure of the generosity of Medicaid eligibility criteria, Maryland appears to have broader eligibility than only three of the comparison states—Colorado, North Carolina, and Virginia. Maryland's ratio of Medicaid-to-Medicare physician fees is also higher than these three states and the same or nearly the same as that in Massachusetts and Minnesota.

Maryland's hospital market was relatively concentrated in 2003, with 72 percent of its residents living in highly concentrated hospital markets. Pennsylvania was similar to Maryland on this measure; of the comparison states, only Massachusetts had a lower proportion of its residents living in concentrated hospital markets. Maryland's insurance market is highly concentrated, as are the markets for insurance in 6 of the 10 comparison states. In the small-group market, Maryland had 16 carriers offering insurance in 2009. Both Delaware and New Jersey had the same number of insurers selling in this market; five of the comparison states had a substantially larger number—Colorado (27), Massachusetts (25), North Carolina (32), Virginia (45), and Wisconsin (50).

With respect to hospital expenses per inpatient day, Maryland's \$1,720 is similar to the figure for Colorado (\$1,699), Massachusetts (\$1,723), and New Jersey (\$1,691). Only Oregon is higher at \$1,977. Among these comparison states, Minnesota is the lowest at \$1,203. Wages for health care professionals are an important component of health care costs. With an average nurse hourly wage of \$31.61 in 2004, Maryland ranked second in the United States and was the highest among the comparison states. Average hourly wages for health care managers were also relatively high in Maryland, with only Massachusetts and New Jersey higher among the comparison states (data not shown). However, wages for internists were lower in Maryland than in all of the states, with the exception of Pennsylvania (no data were available for Oregon). For surgeon wages, Maryland was

⁵³ The Health Insurance Partnership is for employers who: have 2–9 full-time employees; have been in business at least 1 year; are not currently offering employer-sponsored group insurance; and have an average annual wage of less than \$50,000.

roughly in the middle, with five of the states having higher average wages and three lower (no data for Oregon).

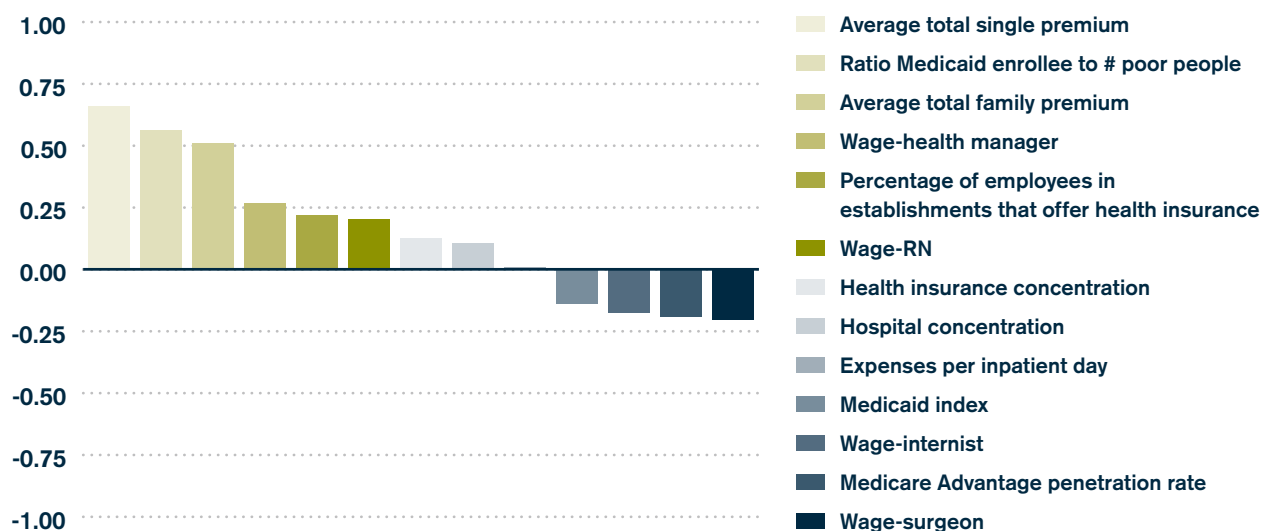
Maryland ranked 8th in the nation in the percentage of employees in private sector establishments that offer health insurance in 2004. There was relatively little variation among the comparison states—Delaware, Minnesota, New Jersey, and Virginia were similar in this regard, with approximately 88 percent to 91 percent of employees offered coverage through their workplace. The biggest gap was with Oregon, where 80 percent of employees had health benefits available. In terms of premium costs, however, Maryland was toward the middle of the states—comparable to the national average for both single and family coverage. Enrollment in Medicare Advantage plans was relatively low, with only 4.4 percent of Maryland’s Medicare beneficiaries enrolled in these commercial health plans in 2004. Only two of the comparison states had a lower proportion of beneficiaries choosing an MA plan—Colorado (0.8 percent) and Virginia (2.6 percent).

Are Market Characteristics Associated with Health Care Spending?

This section presents some information about how the various factors discussed above appear to correlate with the variation in per capita health care spending across states. Because the information presented is based on analysis of the relationship between spending and one factor at a time—without controlling for the effects of other influences—this information does not tell the whole story. For example, high per capita spending may lead state policymakers to enact strong hospital regulations, making it appear that the regulation may be causing the high spending and is ineffective or even counterproductive. However, it is still useful to examine these relationships one-by-one; in the next chapter, a more complex model is analyzed in an attempt to understand how these factors work together. This analysis addresses only the strength of the association; the statistical significance of these relationships is addressed in Chapter 5.

As shown in Figure 4-5, the strength of association with per capita health spending varies across the different policy and market indicators. The strongest relationship is between spending and health

FIGURE 4-5. Strength of Association of Selected Policy and Market Indicators with Per Capita Personal Health Spending, 2004



SOURCE: See Appendix

insurance premiums; this is not surprising given that health insurance is a major component of health spending.⁵⁴ The association between spending and the employer offer rate is modest and positive; again, this is likely because persons with employer-provided coverage tend to spend more on health care. It appears that states with higher spending have health insurance markets that are somewhat more consolidated, offering the possibility that this lack of competition may contribute to health spending. Similarly, states with a higher proportion of their residents living in geographic areas with higher hospital concentration have modestly higher spending.

The associations between per capita spending and the wages of health care professionals differ across occupational categories. There is a positive but modest relationship between spending and nurse wages and between spending and the wages of health care managers; however, there is a similarly sized but negative relationship between spending and physician wages. It may be that in areas with higher spending, there are more market or policy-imposed limitations on physicians' ability to increase their earnings. The proportion of Medicare beneficiaries enrolled in Medicare Advantage plans is also inversely correlated with spending; there is some evidence that MA enrollees are healthier, thus are less costly to insure than other Medicare beneficiaries.

There is a small and negative association between spending and the ratio of Medicaid to Medicare physician fees. One explanation is that states with higher spending are less willing to devote more resources to Medicaid payments. The ratio of Medicaid physician fees to Medicare fees is negatively associated with spending. There is no relationship between spending and hospital expenses per day.

For those variables with only two values (e.g., yes/no indicators), associations are examined by calculating the mean spending for each of the values of

FIGURE 4-6. Mean Per Capita Health Spending Under Different Policy and Market Conditions, 2004

	Average Per Capita Spending
Certificate of Need	
Always 1991–2004	\$5,465
Never 1991–2004	\$4,811
Malpractice Legislation, Cap on Noneconomic Damages	
Always 1991–2004	\$5,217
Never 1991–2004	\$5,556

SOURCE: National Council of State Legislatures, Certificate of Need Health Laws and Programs; Encinosa, Hellinger “Have State Caps on Malpractice Awards increased the Supply of Physicians?” *Health Affairs* 2005; CMS National Health Expenditure Data.

the variables—for example, mean spending in states with Certificate of Need (CON) requirements and mean spending for states without CON requirements. These values are shown in Figure 4-6. States that had CON requirements in place throughout the period 1991-2004 had average per capita spending of \$5,465 compared to \$4,811 in states that did not have CON requirements at any point during this period. As noted above, this could be viewed as evidence that CON programs increased spending by limiting supply or conferring monopoly status on existing providers; however, it is equally possible that the relationship goes in the opposite direction and that higher spending states implemented CON to try to control costs. With respect to malpractice legislation, states with caps on noneconomic damages in place during this period had average health spending of \$5,217 compared to \$5,556 in states without caps in place.

⁵⁴ It may seem tautological to include insurance premiums in trying to explain the variation in health care spending, since premiums are a part of spending. However, the relationship between premiums and per capita spending is not constant across states or individuals within states, and is subject to a number of intermediate influences—for example, the proportion of individuals with private coverage varies by state, the relationship between “prices” for health care services and negotiated payments to providers varies, and the administrative costs of insurance or the loss ratio varies by state.

CHAPTER 5

State Variation in Spending: Which Factors Are Most Important?

The factors discussed in Chapters 2 through 4—population characteristics, supply of health care services, public policy interventions, and market conditions—likely affect health care spending and how that spending varies across states. These factors are interrelated and it is difficult to disentangle how each factor affects health care spending directly. If higher spending is observed in geographic areas with a larger supply of health care resources, such as more hospital beds or more physicians, it could be explained in at least two different ways. Greater supply may be a response to higher demand that is related to poorer health status of residents. Or it may be that the increased supply has a direct effect in increasing utilization and spending for a population with a given health status.

State policymakers may influence the supply and price of services and facilities through policies like Certificate of Need and facility licensing regulations or mandated benefits. Licensing regulations, for example, may limit excess supply, thereby containing spending. It is also possible that limiting supply may have unintended consequences on spending, conferring market power on the owners of the existing services and facilities that enables the providers to increase prices, thus increasing spending in a given geographic area. In a similar way, a policy of mandating insurance benefits may enable consumers to access additional health services in the short run, but over time may increase spending by leading to higher premiums or to carriers exiting the local market.

The causal relationships between policies and regulations and spending can also be difficult to distinguish without a careful examination over time. If Certificate of Need regulations are observed in states with higher spending, it may appear that the regulations are ineffective when in fact they were enacted in response to higher spending. There can also be enormous time lags in market adjustments to changes so that what are observed are short run relationships. It may be

possible, for example, to increase the supply of physicians locally in a short timeframe, but increasing the supply across the state and at the national level will take longer. In the short run, as supply responds slowly to changes in demand, prices may rise with associated impacts on spending.

While the preceding chapters examine the one-to-one relationships between spending and various factors, this chapter examines some of the relationships among the measures examined in those chapters and the extent to which they can collectively account for variation in per capita spending across states. To answer the question of what drives spending levels and variation, it would be necessary to develop a structural model that accounts for the time lags and interrelationships among demand, supply, policy, and market factors as they collectively determine per capita spending.

Instead, the analysis below provides an intermediate step, extending the simple notion of association between each factor and spending discussed above to consider how groups of factors relate collectively to per capita spending. The first three sections consider factors within each of the three categories – demand, supply, and market/policy. In each section, the simple associations described in the first three chapters are briefly reviewed for those that are statistically significant and the associations among the various factors themselves.⁵⁵ Each section ends with an analysis of the collective association of the selected factors with spending, identifying the share of interstate spending variation they can account for and those specific factors that are statistically associated with spending once the other factors within the group are controlled for. The final section analyzes them all together, presenting their combined association with differences in spending levels across the states and isolating those individual measures that

⁵⁵ For these analyses, associations with $p < .05$ are considered statistically significant.

are associated with spending once other demand, supply, market, and policy measures are accounted for. For technical reasons, it does not include all of the measures described in the preceding chapters.⁵⁶ The analyses focus on 2004 data, but parallel estimates were made based on 1998 data—significant differences in the two are noted as appropriate. When the association between a demand, supply, or market and policy measure and per capita spending is identified as significant, Maryland's specific values are examined to see whether they conform to the suggested relationship.

Demand Factors

As described earlier in this report, a population's demographic and health characteristics drive the underlying demand for health care. Chapter 2 presented a number of such factors that are strongly associated with spending, including the proportion of the population that is uninsured, cancer death rate, and the percentage of the population over the age of 65. Table 5-1 shows the associations between different indicators and spending; a positive statistically significant relationship is indicated by a '+' and a negative and significant relationship by a '-.' As shown in the second column of Table 5-1, uninsurance and poverty rates are each negatively associated with spending, so that areas with high spending tend to have low uninsurance and poverty rates. Each of the three population age groups is significantly associated with spending, indicating that spending is higher in states with older populations. Cancer death rate was positively associated with spending in 2004, but in 1998 this relationship was not statistically significant.

Several demand factors studied are also strongly associated with one another. In particular, the poverty rate is highly correlated with the cancer death rate, the proportion of the population that reported being in fair or poor health, and the uninsurance rate. These

associations highlight the challenge of understanding whether poor health results in reduced income or low income levels lead to health problems.

Collectively, the various demand characteristics studied account for just over half of state-level variation in per capita spending (see column 3 of Table 5-1). Controlling for other demand factors in this multivariate analysis, only the cancer death rate was positively associated with per capita spending. Maryland, where per capita spending and the cancer death rate are both slightly above average, is consistent with this pattern. The role of other demand factors may not be evident since key supply, market, and policy variables, such as physicians per capita, are not controlled for in the results reported in column 3 of Table 5-1, but are included below in the final analysis of this report. Other studies find, for example, an association between poor/fair health and spending, but that measure is not significant here.

Supply Factors

Among supply factors analyzed, the numbers of physicians, dentists, and skilled-nursing facility (SNF) beds per capita are each positively significantly associated with state health spending, with all measures higher in areas with high spending. While the share of physicians in primary care is negatively associated with spending, as mentioned in Chapter 2, the association is not statistically significant.

Many of the supply characteristics discussed above in Chapter 3 are highly associated with one another.⁵⁷ For example, the number of hospital beds per capita is statistically significantly associated with dentists per capita, physicians per capita, share of physicians in primary care, and SNF beds per capita. Among these measures, the numbers of dentists and physicians are negatively associated with the number of hospital beds, so states with relatively more beds have relatively fewer dentists and physicians. All of the other measures are positively associated, so increase with the number of beds per capita.

The number of physicians per capita is significantly associated with all studied measures except SNF beds. While the number of dentists is higher in

⁵⁶ Several of the factors within each group are highly associated with one another, such as poverty rate and median income, so inclusion of all of them in a multivariate analysis can lead to misleading results. As a result, some measures that are highly associated with others were omitted here. This also helps address the challenge presented by the small number of cases (50 states) for analysis.

⁵⁷ This is, in part, why some of the variables discussed in Chapter 3 are not included in this analysis.

TABLE 5-1. Association Between Demand, Supply, Market, and Policy Factors and State-Level Per Capita Personal Health Spending, Controlling for Other Factors, 2004

		STATISTICALLY SIGNIFICANT ASSOCIATION WITH STATE-LEVEL PER CAPITA SPENDING		
	MARYLAND'S RANK IN 2008	Not controlling for any other factor	When controlling for other factors of same type	When controlling for factors of all three types (collectively explain 86% of spending variation)
DEMAND FACTORS		Group explains 51% of spending variation		
Percentage of population 65+	39	+		
Percentage of population 85+	31	+		
Percentage of population < 19	19	–		
Percentage of population under poverty threshold	44	–		
Cancer death rate	23	+	+	
Percentage of population fair/poor health	42			+
Percentage of population uninsured	24	–		
SUPPLY FACTORS		Group explains 64% of spending variation		
Short-term beds per capita	39			+
Dentists per capita	6	+		
Physicians per capita	3	+	+	+
Percentage of physicians in primary care specialties	48		+	
SNF beds per capita	33	+		+
MARKET AND POLICY FACTORS:		Group explains 61% of spending variation		
Medicaid enrollment generosity	37	+	+	+
Nurse wages	2			
Hospital costs per day	7			+
Medicare Advantage penetration	32			
Insurance market concentration	30			
Mean insurance premiums	23	+	+	+
Percentage of employees that work in firms that offer insurance	8			
Medicaid fee generosity	25			
Internist wages	38			
Surgeon wages	28		–	
Percentage of population in highly concentrated hospital market	34			
CON 1998-2004 (yes/no)	yes	+		
Malpractice limits 1998-2004 (yes/no)	yes			

NOTE: '+' indicates a statistically significant positive association between the measure and per capita spending; '–' indicates a significant negative association. If no symbol is present, the measure is not statistically significantly associated with spending. The 'share of variance accounted for' reported here is the adjusted r-squared.

SOURCE: See Appendix.

places with more physicians per capita, all other measures, including share of physicians in primary care, are lower when there are more physicians.

Collectively, these supply factors capture over 63 percent of the variation in per capita spending across states in 2004 (see column 3 of Table 5-1). In this multivariate analysis, physicians per capita and the share of physicians in primary care are positively significantly associated with per capita spending; in parallel 1998 estimates, the primary care share was not significant. Interestingly, Maryland has a relatively high number of physicians per capita but a lower-than-typical share in primary care. The Maryland case—relatively high physicians per capita and per capita spending along with relatively low share of primary care physicians—is consistent with other findings that spending is lower where primary care physicians are more prevalent. It may be that the share of primary care physicians is highly associated with factors not included here, such as population health status. As a result, its positive association in this analysis (rather than the negative association found elsewhere) may be the result of those associations not included here. In fact, the observed relationship between share of primary care physicians and spending shifts when those omitted measures are accounted for in the final analysis below.

Market and Policy Factors

The various market and policy factors described in Chapter 4 reflect a broader mix of actors and characteristics than the first two categories, so the relationships with spending, when examined one factor at a time, are generally weaker. Among those characteristics studied, Medicaid enrollment generosity (ratio of Medicaid enrollees to the number of people in poverty), insurance premiums, and consistent presence of Certificate of Need requirements are each significantly associated with per capita spending.

Like the demand and supply measures, there are strong associations among many market and policy factors. Nurse wages is positively associated with per diem hospital costs, while neither is associated with internist or surgeon wages in 2004; in 1998 nurse wages and hospital costs were significantly and negatively associated with surgeon wages. And, although the association is not statistically significant, the Medicaid enrollment generosity measure is negatively associated with the Medicaid fee

generosity measure (ratio of Medicaid to Medicare fees), suggesting that states trade enrollment policies against provider payment levels. This negative relationship was nearly statistically significant in 1998.

Together, these market and policy factors explain just over 60 percent of variation in 2004 state-level per capita health spending. There is a stronger association between market and policy measures and state-level spending than estimated for 1998, suggesting that the relationship among these factors and spending has grown over time. When controlling for other factors, Medicaid enrollment generosity and average insurance premiums are both positively significantly associated with spending in 2004, while surgeon wages are negatively significantly associated with spending levels. In the case of Medicaid enrollment generosity, Maryland is not consistent with this pattern, since it has relatively high spending but a relatively low ratio of Medicaid enrollees to people in poverty. Maryland's mean surgeon wage is slightly below the national average, consistent with the negative association with spending identified here, while its mean insurance premiums are just at the national average.

Putting Them All Together

Given the strong associations among spending and factors in each of the three groups, it is not surprising that the demand, supply, and policy/market factors described in earlier chapters *in combination* account for nearly 90 percent of per capita spending variation across states in 2004.⁵⁸ While all 25 of the variables included in the analysis contribute to this high total, only seven are significantly associated with per capita spending when all other factors are controlled for (see Column 4 in Table 5-1)—

- Share of the population in fair or poor health,
- Short-term general hospital beds per capita,
- SNF beds per capita
- Physicians per capita
- Medicaid enrollment generosity,

⁵⁸ Estimates from 1998 show that the factors combined account for a comparable share of spending variation but, given differences in data availability, it is difficult to make factor-by-factor comparisons between the two years.

- Hospital costs per day, and
- Private, single-coverage insurance premiums.

All of these are positively associated with spending, meaning that they are relatively higher in states with high per capita spending.

Many of the statistically significant associations with spending from the three group-specific analyses (demand, supply, and policy/market) do not persist when all of the factors are included in the analysis together. For example, while cancer death rates were significant when considering only demand-side factors, they are no longer significant when controlling for supply, policy, and market influences. When controlling for all of these factors, the only significant demand factor is the share of the population in fair or poor health. Maryland is not consistent with this overall pattern, since, compared with other states, it has relatively high per capita spending but is ranked 42nd in share of the population reporting fair/poor health. However, between the late 1990s and 2004, this group grew more quickly in Maryland than it did nationwide, putting additional pressure on spending.

While the number of physicians per capita persists in being a statistically significant factor, the share of physicians in primary care does not. Instead, once demand, market, and policy factors are controlled for, the numbers of hospital and SNF beds per capita emerge as positively and statistically significantly associated with per capita spending. Maryland's relatively high physician supply per capita and spending are consistent with this overall pattern, but the state's relatively low numbers of hospital and SNF beds per capita are an exception to it.

Medicaid enrollment generosity and insurance premiums have been significant in each of these analyses. Maryland is close to the national average in terms of premium levels and, while the consolidation of its insurance market is 'high,' Maryland is in the middle of the states on this measure as well. Hospital costs per day also emerge as significant once demand and supply factors are controlled. Maryland's hospital costs per day, 7th highest in the nation in 2004, are consistent with its relatively high per capita health costs.

These analyses provide a consistent way to assess the different factors that policymakers may want to consider as they try to control health care spending growth. However, they do not present a causal model that disentangles the many interwoven processes that drive spending. For example, the association between the number of physicians per capita and health care spending could reflect differences in underlying health status, differences in the efficiency with which care is provided, or differences in the effectiveness of care. Distinguishing clearly among these alternatives will remain challenging until reliable, consistent data on salient outcome and quality measures that help track the 'output' of the health care system become available.

Along with a number of other states, Maryland is moving in the direction of measuring quality of care as part of a broad effort to better target spending. The underlying goal is to identify processes of care and health outcomes that signify higher quality as based on clinical evidence. This is being done in Maryland through the Health Services Cost Review Commission's Hospital Quality-Based Reimbursement Initiative and the Maryland Health Care Commission's Quality Measures Performance Evaluation Guide and Quality Measures Data Center. A number of private insurers are also incorporating aspects of quality performance into their payment systems, by including an additional payment for physicians that meet specified standards of care.

While these policies do not directly target the level of resource supply, their intent is to create incentives to use existing resources more efficiently. As these initiatives mature, we would expect to see changes both in the level of supply and the mix of resources, with growth in those producing higher quality care and declines in those that do not. Ultimately, one would hope to observe a shift in the relationship between resource supply and spending in those states that are more successful in promoting quality health outcomes.

Other policy initiatives currently being considered may appropriately respond to the association found between health status and spending. A number of measures aimed at supporting the primary care workforce are underway as is an initiative to implement a medical home model. With an increasing proportion of Maryland residents suffering from multiple chronic health conditions (as in the nation overall),

emphasizing primary care management of chronically ill patients and coordination of their care across different sites is one means to make spending more effective.

Although the proportion of Maryland residents 85 years of age and over is below the national average, as the population ages and the proportion of persons with chronic health conditions increases, there will be a growing need for additional health care resources for this patient population. Similarly, additional resources and increased spending will be required if there is expanded health coverage for previously uninsured populations. Policies attempting to hold down growth driven by changes in population and health status may result in access barriers that have an adverse impact on population health. Thus, rather than simply limiting all spending increases, policies need to emphasize the appropriate mix of resources and, in particular, the supply of resources that corresponds to specific changes in the population's disease burden.

In all of these efforts, the appropriate levers must be found to constrain inefficient use of health care dollars while targeting appropriate spending that contributes to improving the quality of care and health outcomes. In this way, the ultimate goal is to "bend the cost curve" and permanently slow spending growth. To accomplish this, changes will have to be made within the health care system, in the incentives facing providers and payers. Beyond the health care system, consumers will need to adopt lifestyle and health behavior changes that contribute to the prevention of chronic disease.

APPENDIX

Data Sources

TABLE A-1. Data Sources

MEASURES	Area Resource File	U.S. Census	Literature	CDC, Wonder Population Estimates	Centers for Medicare & Medicaid Services	Medical Expenditure Panel Survey— Insurance Component	Kaiser Commission on Medicaid and Uninsured	Bureau of Labor Statistics (BLS)	Kaiser Family Foundation Web Site (statehealthfacts.org)	United Health Foundation, America's Health Rankings	National Council of State Legislatures (ncsl.org)
HEALTH CARE SPENDING											
Total Per Capita Personal Health Care Spending					X						
Share of Spending, by Source of Payment and Service Type					X						
DEMAND											
Percentage Foreign Born		X									
Percentage Hispanic/Black		ACS		X							
Percentage Poverty Level		SAIPE									
Percentage Rural	X										
Percentage Uninsured		CPS	Denavis, et al.								
Age Statistics (%65+, %85+, 19 and Under)				X							
Fair or Poor Health Status										X	
Cancer Mortality Rate				X							
Median Income		SAIPE									
Population Statistics 1991–2004				X							
SUPPLY											
Dentists per 1,000 Population	AMA										
Physicians per 1,000 Population	AMA										
Other Professionals per 1,000 Population	AMA										
FQHCs and RHCs per 1,000 Population	CMS										
Hospital Beds per 1,000 Population	AHA										
Skilled Nursing Facility Beds per 1,000 Population	AHA										
Percentage PCPs	AMA										

TABLE A-1. Continued

MEASURES										
MARKET AND POLICY										
Area Resource File	U.S. Census	Literature	CDC, Wonder Population Estimates	Centers for Medicare & Medicaid Services	Medical Expenditure Panel Survey— Insurance Component	Kaiser Commission on Medicaid and Uninsured	Bureau of Labor Statistics (BLS)	Kaiser Family Foundation Web Site (statehealthfacts.org)	United Health Foundation, America's Health Rankings	National Council of State Legislatures (ncsl.org)
		Encinosa								
						X				
		Zuckerman/Norton								
				X						
					X					
					X					
								X		
							X			
										X
										X
								X		
		Atkinson, G.								
		AMA								
		Bunce/Weiske								

DATABASES

1. Area Resource File—Collection of data compiled by Health Resources and Services Administration, which includes data from the American Medical Association, American Hospital Association, U.S. Census Bureau, Centers for Medicare & Medicaid Services, Bureau of Labor Statistics, National Center for Health Statistics
 - a. AMA Physician Master File
 - b. AHA Hospital Survey Database
 - c. CMS Provider of Services
2. Small Area Poverty and Income Estimates—created by the U.S. Census to provide current estimates of income and poverty statistics for states, counties, and school districts.
3. Centers for Disease Control and Prevention, Wonder Population Statistics—Wide Ranging Online Data for Epidemiological Research. Menu driven system used to provide access to wide array of public health information.
4. Centers for Medicare & Medicaid Services—Research, Statistics, Data and Systems. Provides data on utilization and enrollment of Medicaid and Medicare beneficiaries.
5. Medical Expenditure Panel Survey—Insurance Component—MEPS is a set of large-scale surveys of families and individuals, their medical providers, and employers across the United States. The Insurance Component (IC) collects data from a sample of private and public sector employers on the health insurance plans they offer their employees.
6. Kaiser Commission on Medicaid and the Uninsured—Provides key data, trends, and issue on Medicaid and Managed Care.
7. Kaiser Family Foundation State Health Facts (statehealthfacts.org)—provides data on more than 500 health topics for all 50 states and is linked to both the Kaiser Family Foundation Web site (www.kff.org) and KaiserNetwork.org (www.kaisernetwork.org).
8. Bureau of Labor Statistics (BLS)—Independent national statistical agency that collects, processes, analyzes, and disseminates information on labor economics and statistics.
9. America's Health Rankings—Annual assessment of U.S. Health on a state-by-state basis, focusing on four components: Behavior, Environment, Public Health Policies, and Clinical Care.
10. American Community Survey—Population-based survey conducted by the U.S. Census Bureau helps communities determine where to locate services and how to allocate resources.
11. National Council of State Legislatures—Bipartisan organization that provides research, technical assistance, and opportunities for policymakers to exchange ideas on the most pressing state issues.
12. Current Population Survey (CPS)—Monthly survey of about 50,000 households conducted by the Bureau of the Census for the Bureau of Labor Statistics. Primary source of information on labor characteristics.

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